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Venereal Diseases and the War
Surgeon General W. C. Gorgas, U. S. A.

Ventilation of Army Barracks
Wm. J. Mauer

The Control of Communicable Diseases in Camps
Major Isaac W. Brewer

Prophylaxis of Industrial Poisoning in the Munition Industries
Dr. Alice Hamilton

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American Journal of Public Health

Official Monthly Publication of the American Public Health Association

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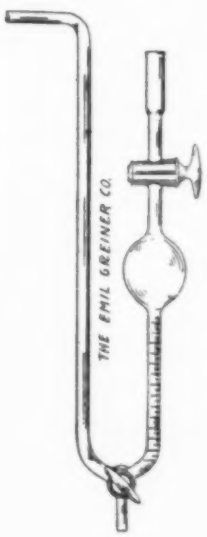

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VENEREAL DISEASES AND THE WAR.

SURGEON GENERAL W. C. GORGAS, U. S. A.,
Washington, D. C.

Address before the General Sessions, American Public Health Association, October 19, 1917, at Washington, D. C.

THERE is probably no occasion for pointing out to this association the enormous importance to the military establishment which lays in a proper control of the venereal diseases as far as the army is concerned. It is the greatest cause of disability in the army. The army loses more days of service from its men due to venereal diseases than from any other cause. If the medical department of the army had a choice presented to it, say if some man came with a wand and it were demonstrated that with this wand every wounded man could be gotten back into the line at the end of the second day, with his wound cured; and another course were presented by which all venereal diseases could be eradicated from the army, and our choice were given, permitting us to leave out all sentimental reasons, such as the moral effect upon the community, and allowing us merely to consider the good of the army, and our ability to keep in the line the largest and most efficient fighting force, I think there would be very little hesitation on the part of our department in choosing the eradication of venereal disease. We, in the course of the year, would be able to keep more men in the trenches and have a more efficient force by having eradicated venereal diseases than by eradicating wounds. It does not take long to see how important and how true this is. A man with a flesh wound through the thigh is back in the trenches within ten days or two weeks, frequently in less time. If he contracts a venereal disease, his average disability is very much longer. In other words, to the commanding general, the loss is greater for a man who contracts gonorrhea than for a man who is shot through the thigh, and if the commanding general could lay aside all question of morality, he would probably choose the eradication of venereal disease rather than the prevention of wounds. I merely point that out to show the great importance of the control of venereal diseases as a practical measure to the military sanitarian. Now as to what we can do in these directions, that is of course a question that we are considering very closely and a question that all military

sanitarians consider. All of us have our views. I am inclined to think that the military sanitarian leans too much toward the control by actually treating and caring for the case after it occurs and the individual prophylaxis. A large element of our sanitarians believe in the educational process and prevention in that way. My own personal experience inclines me very strongly to the educational side, although of course I like to use all measures that furnish the hope of control. My personal sanitary experience has been very largely in the care and prevention of yellow fever, and my experience in that disease tinctures my sanitary ideas concerning the problem under consideration. When I commenced professional life, had we considered all diseases as we then knew them, I presume that any sanitarian would have thought he had a much greater chance in the controlling of venereal disease or in eradicating smallpox or tuberculosis than he had of doing anything at all with yellow fever. We knew how venereal disease was contracted. With smallpox we could see the perfect possibility of eradicating the disease provided we could carry our prophylactic measures into complete execution. We had vaccination and felt perfectly confident that we could take a company of soldiers, and, by proper vaccination, protect them entirely from smallpox; but with yellow fever we had no idea how to practice preventive methods. Yellow fever to the American army and armies serving in America was of vast importance when I first commenced professional life. When the method of its prevention came up and it was discovered that the mosquito was the carrier, we did not see much further along than we had seen before. We knew the role played by the mosquito, but it did not seem to us that we had any practical means of preventing the mosquito from continuing its carrying of yellow fever as he had been doing for several hundred years before—I suppose he did it for several hundred years before; our experience with yellow fever dates from when it began to spread among the whites after the discovery of America. Before that time it had been confined to very narrow areas, but we went to work in Havana and when we began to put our preventive measures into effect, we loaded our guns as we would a shotgun, we sat down and thought of all the possible things that could affect it, and started out putting them all into effect. Our friend Doctor Chapin came to Havana about that time and affected me very strongly by his views which he was then beginning to develop, that contact was the great means of spreading most infectious diseases. But we went along with our sanitary measures for yellow fever and finally got rid of it entirely in Havana after probably a year's experience with it; but we were all, as the result of this work, convinced that the greatest measure that had been successful was by the isolation and screening of patients and thereby preventing the patient getting access to uninfected persons. We were entirely wrong; I do not think those measures had much effect upon our success, and it was apparently entirely another measure

which we carried along at the same time but which we had not given very much stress in judging the results. The measure that was really successful, as we found out afterwards and know now, was the eradication of the particular mosquito that carries the disease. In looking forward to our work, we could see that it was almost impossible to eradicate all mosquitoes and thereby get rid of the particular mosquito that carried the disease, but because a measure cannot be perfect in practice, it is not necessary to be perfect generally; while you cannot eradicate all stegomyia mosquitoes in a place in any ordinary period of time, you can very greatly decrease them. Now you see that a person coming into a community where there are ten mosquitoes, we will say, to any given area, to the acre, in a town, possibly if he went into that acre he would stand a very small chance of being bitten by one of these ten infective mosquitoes; whereas if there were a thousand, his chances would be a great deal increased. Now in practice, if we can destroy mosquitoes below a certain point, the disease will not spread. It is not arbitrary rule, but for practical purposes, when you get your mosquitoes below that point, your disease will not spread. When we next had the disease, we tried in the most extensive way, the killing of infected mosquitoes, screening, etc., without any effect. For about a year we carried into effect all our methods and did it most extensively, which is an illustration of what we had to consider in sanitation and will have to consider in venereal disease. The destroying of infected mosquitoes and screening was so obviously good that it was easy to convince the authorities that it should be done. It was not so obvious that it was good to destroy all mosquitoes, and it was more difficult to convince them. It took a year of failure to convince them that it was necessary that we should do so. Probably if the sanitary officer had had more knowledge and concentrated his eloquence upon the governor with regard to destroying all mosquitoes, he could have been more successful.

Now I am inclined to think that our relations with regard to venereal disease bear somewhat the relation that the sanitary officer had toward yellow fever. I think in going into that we should try all our measures that are practical, but I do not believe that we are going to have any very great success, such success as we had in yellow fever, until we get our communities educated up to the point of believing that it is the individual action and the individual beliefs of our people affected that are finally going to control the disease. It seems to me that if all of our communities were educated up to the point that the female portion of our population have been, with regard to venereal disease, we would have success in it. If the sexual morals of our male population were on the same plane as the sexual morals of our female population, I am inclined to believe that venereal disease prevention would be far on the road to success, and I hope that this relation of morals can be brought about by the very general educational processes that we are

at present engaged in spreading through our population.

For military purposes and the purposes of this war, it would be obviously unwise to wait for any slow process of that kind, and any general degree of education. We have to do as we did in yellow fever, load our gun as we would a shotgun and fire at everything in sight, and such are the plans that we are evolving in the army and around our military camps, appealing to all the assistants we can get, to every possible assistance that the civil population in contact with the army can give us in this direction, and at the same time doing everything that we can do in the army towards individual prophylaxis of the men. Such a possibility as educating the population is not a vague dream. Customs and manners can be controlled almost absolutely by education. Take an example that has always impressed me very strongly, of how custom in itself has affected the two sexes as far as manners are concerned. Now take for instance the use of tobacco; the two sexes differ with regard to their use of tobacco purely as the result of belief and custom. The male of our population has acquired the habit of smoking, principally in youth, because he has been taught to look upon it as manly and the proper thing. In the case of the other sex, no such influence has been brought to bear; the female of our population does not look upon smoking—or has not until very recently—(laughter and applause) as being the proper and manly thing. There is no influence brought upon the young woman in general to teach her to learn the habit of the use of tobacco. Among the educated classes of our population the use of alcohol is prevented to a very great extent among the female portion of the population by the same influences. I am merely pointing out that education would have the very greatest effect upon this question of the morals in venereal disease. Another thought that comes up in relation to yellow fever and the question which we are discussing—and I hope you will excuse me for my mind running upon yellow fever, because naturally, with thirty years spent in thinking almost entirely upon the question of yellow fever, I would get rather one-sided—yellow fever now is almost forgotten; I was asked to read a paper the other day and suggest topics of general sanitation for an examination I was engaged in, I was asked to suggest questions in prophylactic medicine, and I suggested the question of asking the symptoms of yellow fever. The board said "Doctor, yellow fever is academic, there is not a single one of these men who is coming before you who has any idea what yellow fever was or is"; so I must ask to be excused if I am one-sided, if I am a back number in regard to sanitation on this question, having dwelt so much on yellow fever; but I would like to recall this to you, in regard to yellow fever and syphilis, and that is, that they were both, like the Irish potato and the turkey, given to us by the Western Hemisphere when Columbus discovered America, and probably if we had been asked, for 300 years after the discovery, which was the greatest evil of the human race, everybody

would have agreed that yellow fever was the one. The military surgeon would have agreed that as far as military operations were concerned, in the Western Hemisphere, yellow fever was the greatest of all evils. Surgeons have forgotten what complete destruction yellow fever caused among American troops, particularly in the Tropics.

I want to appeal to the health officers of the country on the importance of the civil health officer notifying in the case of all contagious diseases. The value of the army itself, the importance of our knowing these things so that we can be on guard and be ready to prevent the access of infectious diseases from the localities around us; merely calling attention to the fact probably emphasizes it sufficiently. All health officers will at once see how important it is to the military authorities to know where the infections occur. I want to take occasion at the same time to thank the profession at large, the civil health officers in general and this association in particular for the great assistance that they have all been in our efforts to get ready for this war, the enormous assistance they have been to the medical department of the army in getting together sufficient personnel for the carrying on of this war and performing our functions as far as health is concerned. We started in this war with less than 600 men in the medical corps of the army; we now have approximately 20,000, due to the assistance that all these great bodies have given to the army. I thank you.

◈

Recent Progress in Tuberculosis.—Dr. J. B. Howes, 2d, and Dr. P. C. Bartlett review the work that has been done in the study of tuberculosis, as evidenced by the important articles that were published during 1916. The review appears in the *Boston Medical and Surgical Journal* for October 18, 1917.

Speaking of tuberculosis in adults, it is agreed that an early diagnosis is important in combating the disease. The diagnosis, however, must be certain, and for this, constitutional signs and symptoms are very important. The presence of tubercle bacilli in the sputum, is not, as a rule, an early sign, and is no longer a requisite for diagnosis. The various laboratory methods used to make an early diagnosis are in the main of little value. The complement fixation test is still in the experimental stage. It is the belief of the authors that tuberculosis is being diagnosed better today than ever before.

In the treatment of the disease, it is agreed that the sanatorium is superior to the home. The advantages are, careful supervision by experts, reduced cost to the patient and the community, formation of new, healthy habits and character, and the development of missionaries to preach how to live well. Climate seems to play a small part in the treatment of the disease. The patients should have sufficient rest and should be permitted to exercise only under direction. It is important to furnish patients with some kind of work.

The greater protection of the health of school children is urged, by full time supervision, more school inspections and nurses, and more fresh air rooms and open air schools for all children.

Many infections take place in early life in the home. Every precaution should be taken to avoid this. Children should be given only pasteurized milk. Kissing on the mouth should be prevented. Coughing mothers and nurses should be examined. Personal hygiene should be taught to every child. Furthermore outdoor schools for children who are well should be encouraged, whereas overstrenuous exercise should be discouraged.

VENTILATION OF ARMY BARRACKS.

WM. J. MAUER,
Engineer, Chicago Commission on Ventilation, Chicago, Ill.

Read before the Sanitary Engineering Section, American Public Health Association, October 18, 1917, at Washington, D. C.

THE ventilating engineer stands in ill repute today in the eyes of many, not because of lack of knowledge or skill on his part but because of a lack of uniformity of opinion and the need of standards of good air conditions and installation methods.

Ventilation is a definite problem, although varying under different conditions, and each case has its definite solution. The haphazard method of opening a window here and there is not the solution. The proper arrangement of supply and exhaust; the proper allowance of window space for air space; window height for room height; space per occupant, and air distribution and velocity is as definite a problem for the heating and ventilating engineer as the proper portioning of flange areas and web area in a plate girder is to the structural engineer, or intensity of light, size of opening, and time of exposure is to the photographer.

That some of the vital points on proper housing have in the past been overlooked in the design of barracks is evident from the number of cases of disease that existed in camps.

Young men from all walks of life are now concentrating at various training points and as many as 200 are being housed in the same building. If any one of these has measles, mumps, meningitis, pneumonia or other diseases the entire number in that building may be exposed to the infection, and this is especially dangerous when the air supply is inadequate and other points of sanitation are disregarded.

In a recent article by Frederic J. Haskin, special correspondent for *The Chicago Daily News*, the conditions of the French army in the present war were given. He states that "France has discharged 200,000 soldiers on account of tuberculosis since the beginning of the war, and the spread of the disease in the British army has reached such alarming proportions that the civilian population has organized to combat the situation." This comes at a time when France is making a struggle for existence. The fault is not with the French army but with the French people, and when I say this I mean the French medical and engineering societies. "Before the war the death-rate from tuberculosis was nearly three per thousand of population; in the cities the percentage running much higher." The cause was found by the Americans in France who formed a committee for investigation. It was given as *lack of fresh air*. The French are far advanced in the science of anaesthesia and surgery, but backward in sanitary matters. The committee proceeded to educate the public on the value of fresh air and now "windows are being sawed in hundreds

of peasants' homes which boasted of none before the war. The propaganda of fresh air and sanitation is having its effect."

"Nothing has proved more discouraging to the fighting forces in Europe than the verdict of the army physician—'wounded with tuberculosis'—a verdict which should be to Americans both a call for help and a cry of warning."

The science of warfare from a standpoint of destruction of life and property has progressed to a most terrible degree in the present war. The medical profession too has made wonderful progress, but the biggest discovery that the medical profession ever made is that "an ounce of prevention is worth a pound of cure."

There have been not less than seven billion lives lost in warfare. Each nation to conquer and become a world leader has had something new to defeat the old. Our efforts should be for the healthiest army of men the world has ever seen. With our problems of transportation, observation, communication, construction and destruction worked out to the present high standard it is a reflection on our civilization to have the problems of health and sanitation lag behind.

Longmore's and other tables show that in the wars of the past two hundred years, which were for a prolonged period, 20 per cent of the total deaths were from bullets and 80 per cent from disease, and comparing this with our Spanish-American War 7 per cent of deaths were from bullets and 93 per cent from disease.

Japan has done more towards preventing disease than any other country and in its war with Russia, six years after our war with Spain, Japan showed a loss of four men or 80 per cent in battle to one man or 20 per cent from disease. This is not the result of good fortune but of precaution. After making a careful and scientific study of army diseases the rules were laid down by the best authorities in Japan and obeyed to the letter by the army. There was no vaccination for typhoid and yet there was practically no typhoid. The army marched through Manchuria, which peninsula is infested with human refuse and a hot bed for typhoid, but the army remained free from the disease because their drinking water was tested and approved before being consumed. No houses that had previously been inhabited by filthy natives were occupied by the army until they had been fumigated and cleaned and remodeled in every respect.

Japan has demonstrated to the world the strength of a healthy army as against the weakness of a diseased army.

We are now eleven years in advance of the Russo-Japanese War and have all the disasters of previous wars before us. Have we learned all that they tried to teach?

Feeble attempts have been made to establish standards for armies of various countries. The cubic feet of space allowed per soldier in barracks has varied from time to time, and in various countries, but the general tendency has been to increase the space.

French infantry, 421 cubic feet.

French cavalry, 491 cubic feet.

Prussian army, 631 cubic feet.

The English government found by Royal Commission that 600 cubic feet was sufficient, provided "local position of barracks be open and airy; the structure of the building simple and admitting free external air and internal movement of atmosphere, and provided the barrack rooms as well as all internal parts of the building are duly ventilated." This shows that the subject has been given some thought, but what engineer would specify "admitting free external air, allow internal movement of air and the building shall be duly ventilated"? This, however, has been made a part of the regulations of the English army. An inspector must inspect monthly, examining the ventilation, heating, light, latrines, closets and all other parts. Besides this, the regiment details a certain number of men to give these points a daily inspection.

Heating of Barracks.

Shall the men in our army barracks be subjected to extreme changes in temperature and thus become physically hardened?

At first glance it would seem that to prepare an army for war the proper procedure would be to break away from our artificial manner of living and expose our men to heat and cold alike and pick the survivors as those best fit to serve us at the front; in fact, it has been stated there should be no heat supplied to barracks and that the exposure will harden the men and make them more fit for service.

A statement like this is fundamentally wrong and coming, although unofficially, from men in the army it should immediately be argued down. The first tendency for men in a cold room is to close the windows and fill up all openings with papers and rags and thus prevent the free entrance of fresh air and the exhaust of foul. This calls to our mind Ralph Wilder's cartoon of the man closing his bedroom window and the pneumonia germ sitting on the bedpost making the very fitting remark "Whee! he is shutting the window, now I will get him." The next inclination is for the men to huddle in one corner of the room and keep warm by an interchange of body heat. The results on health from this kind of housing are too well known to be discussed at this time.

It might be possible to give orders against the closing of windows and against the crowding of men into corners of the room, as mentioned above, and let us assume that these orders can be followed out to the letter, the following will be the result:

Air that is too cold causes lack of activity; requires more food; causes a lowered vitality; breeds discontent; and the army will show loss of energy and enthusiasm. The argument of "survival of the fittest" is wrong today—the tendency is to conserve and build up.

It is against all good argument and reasoning to house a man in a room with a temperature lower than 10° above the freezing point of water. A German authority on army camps gives 12° C. or 53½° F. as a minimum.

The best system would be steam heat from a central plant and cast-

iron wall radiators in the barracks. The temperature should not be too constant, to prevent monotony, and a variation from 45° to 55° would be invigorating and conducive to physical activity.

The barracks that are heated by stoves will be subject to considerable drafts. The heat of a stove is local; those being close by will be too warm while those further away will be too cold. A stove requires constant attention and is the source of considerable dust and dirt, not to mention the danger of fire in the building.

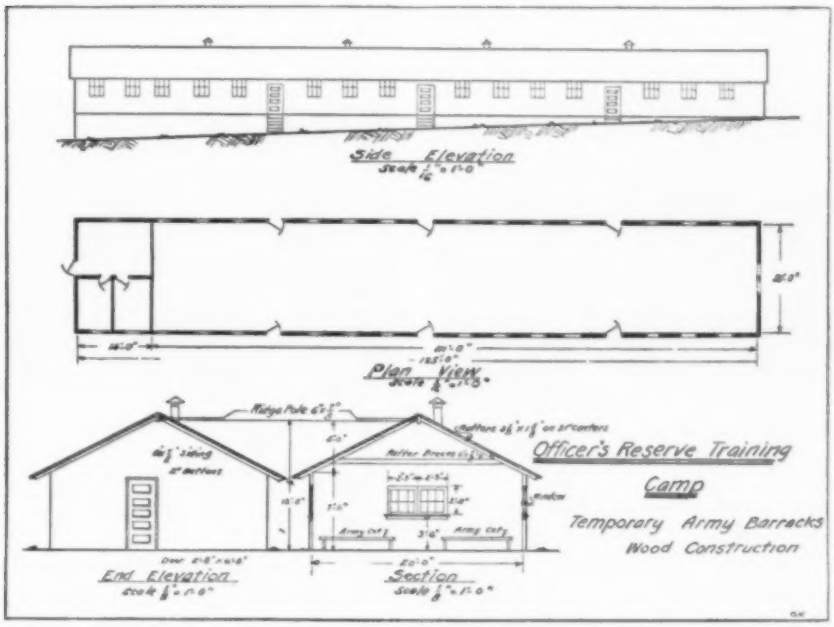

FIGURE 1—OFFICERS' RESERVE TRAINING CAMP.

BARRACKS AT O. R. T. C.

The barracks that are being built by our government for the care of men enlisted in the Officers' Reserve Training Camps are as follows:

There are four buildings required to house one company, two buildings being used for sleeping quarters, one as mess hall and one for wash rooms, shower room and toilets.

We are chiefly interested in the sleeping quarters or barracks proper. This building as reproduced from measurements and photographs is of wood construction, 125 feet long and 20 feet wide. One end is used for office purposes and for officers' quarters and is separated from the remainder of the building by a wood partition extending to the roof. The main portion of the room is used by 80 men and is 111 feet long.

The roof is quarter pitch, built of $\frac{7}{8}$-inch material and covered with roofing felt saturated with asphalt. The sides are $\frac{7}{8}$-inch material with batten strips on the outside. The sides are brought within 3 inches of the roof and this space is open, allowing the free admission of air. This space as well as the doors and windows are screened.

The windows are 2 feet 9 inches wide by 2 feet 11 inches high and there are 28 in the main room, 13 on each side and 2 at one end. These windows slide horizontally and can be opened their full area.

FIGURE 2—OFFICERS' RESERVE TRAINING CAMP.

There are six doors in the main room, 3 on each side. Each door is 32 inches wide by 6 feet 8 inches high.

The barracks are lighted by electricity with 60 watt lamps, 10 feet centers, located on the rafters and along the center line of the building.

There are four openings in the roof with metal stacks for stove heaters, three being in the main room and one in the office quarters.

The buildings are of open construction and as they now stand would be very unsatisfactory during severe winter weather. This, however, can easily be overcome by lining with wallboard or similar material and allowing an air space between it and the outer wall. The space at the eaves would need to be nailed tight or provision made for opening and closing at will in cold weather.

The cots are arranged along the wall, transversely to the room, with the head end about 6 inches from the side wall. The windows are 42 inches above the floor and at this height is a 12 inch shelf against the wall. This shelf is used for books and other personal belongings and serves as a shield for the sleeper's head from the direct draft of the window.

FIGURE 3—OFFICERS' RESERVE TRAINING CAMP. INTERIOR.

Note: Windows open horizontally; shelf for books, etc.; clothing scattered about; bed is put up for the day in the manner shown.

As there are 80 men in the main room each man has an allowance of 260 cubic feet of air space, 28 square feet of floor area and 2.8 square feet of window area. Based on the experience of tests made in other buildings it is predicted that the CO_2 will run as high as 12 parts per 10,000.

There is no provision for wardrobe, and a rafter on alternate roof trusses makes a convenient place for the men to hang their clothing. This is clearly shown in the accompanying picture. The dust will run high and if the clothing is damp there will be considerable odors. But the dangerous feature of this practice is the possibility for the spread of disease germs.

The cots are too close together. They are the standard army canvas top cots being 6 feet 6 inches long, 27 inches wide and about 14 inches from the floor. They are arranged in pairs, 17 inches between pairs, which gives 6 feet centers of pairs.

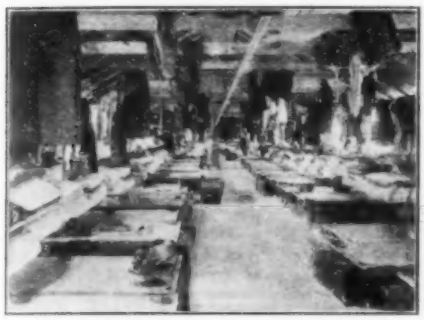

FIGURE 4—OFFICERS' RESERVE TRAINING CAMP. INTERIOR.

Note stove, arrangement of cots and the clothing suspended from rafters.

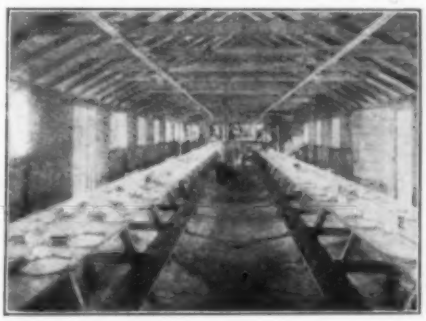

FIGURE 5—O. R. T. C. MESS HALL.

Kitchen at far end; stove heat.

The interior of the barracks are smooth finished but have not as yet been painted or whitewashed.

At each entrance is a shoe scraper about 30 inches long and 20 inches wide, built of 2-inch by $\frac{7}{8}$-inch wood strips set vertically with $\frac{7}{8}$-inch space between them. This scraper also serves as a doorstep. It is an excellent device for cleaning the shoes before entering the barracks and helps considerably to keep down the dust.

BARRACKS FOR THE DRAFTED ARMY.

The plans for the barracks for the army of drafted men were disclosed this summer and are shown herewith, as reproduced from the *Engineering News-Record* of July 5, 1917. These are somewhat different from the barracks just described. They are two stories high with sleeping quarters for 200 men and each containing its own kitchen and mess room, while the toilets are in separate buildings. The plans have now been changed to house 150 men in these buildings.

Each barrack is 43 feet wide and 140 feet long, 20 feet of which is but one story high and is used as a kitchen. The ceilings are 9 feet high. On the first floor is a room with 32 double deck bunks, another room as the Company hall, and next to this the mess hall with the kitchen at the end. On the second floor are two rooms for sleeping purposes, one for 36 bunks and one for 32 bunks. Between these

two rooms are the first sergeant's office and a large hall. Double deck bunks are contemplated.

The buildings are of wood construction with metal roofs. The side boarding must give a 15-inch clear space above the ground or be carried down to the ground all around.

Lockers are provided in the sleeping quarters and located in the center of the room so as to divide the room into two parts. On the first floor, area and 6 square feet of window area. It is predicted that the CO_2 will run 10 parts per 10,000 unless the windows are very carefully adjusted. The windows are of the double hung vertical sliding sash type.

The arrangement of bunks is better than in the barracks previously described, in that they are further from the wall, but it is still a question in the minds of some whether double deck bunks are as satisfactory as the single.

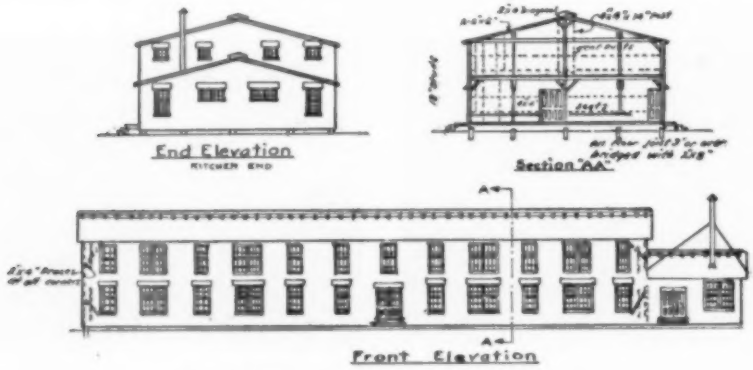

FIGURE 6—BARRACKS FOR DRAFTED ARMY.

(From *Engineering News Record*, July 5, 1917.)

space is provided for four stoves. The smoke pipe of each stove is provided with a drum on the second floor.

There will be 8 vent ducts 18 inches by 18 inches set in pairs and extend from the first floor ceiling to the ridge vent. The ridge vent runs the entire length of the building.

With 200 men there is an allowance per occupant of 300 cubic feet of air space, 33⅓ square feet of floor area and 4.5 square feet of window area, while with 150 men there is an allowance per occupant of 400 cubic feet of air space, 44 square feet of floor

The dust count will probably be high because of the presence of lockers all through the center of the room. Men will come from out of doors and their clothing will be dirty or dusty and there will be a great temptation to brush the clothing or shake it on placing same in the lockers. It seems that both from a dust and bacterial standpoint it would be much better to have the lockers in a separate room by themselves, as for instance in the hall shown on the second floor.

The heating system was also changed from stove heat, as at first proposed, to

steam heat. This is a very important change, the advantages of steam over stove heating having apparently been recognized.

In Dr. John S. Billings' report dated 1868 the following was read with a great deal of interest: "Doctor Craig's test for air conditions in a barracks is simple and practical," and it is described as follows: "Go into the room about 3.00 a. m. after 15 minutes' walk in the fresh air. If no musty, unpleasant odor is perceived under such circumstances, the ventilation is probably satisfactory."

The barracks as described above will probably pass the test as outlined by Doctor Craig. This test, however, would prove no more than the taste of water would disclose the presence of typhoid bacilli.

Suggested Specifications for Army Barracks.

Dr. Arthur Reynolds, former Health Commissioner of Chicago, gives some very valuable suggestions in his article on "Ideal Training Camps," which article appeared in the July, 1917, issue of *The Chicago Medical Recorder*. One suggestion is to limit the barracks to two men. There would be a lack of sociability among the men and for this and several other reasons the writer believes that a *Squad House*, caring for eight men (a corporal and seven privates) would be more desirable;

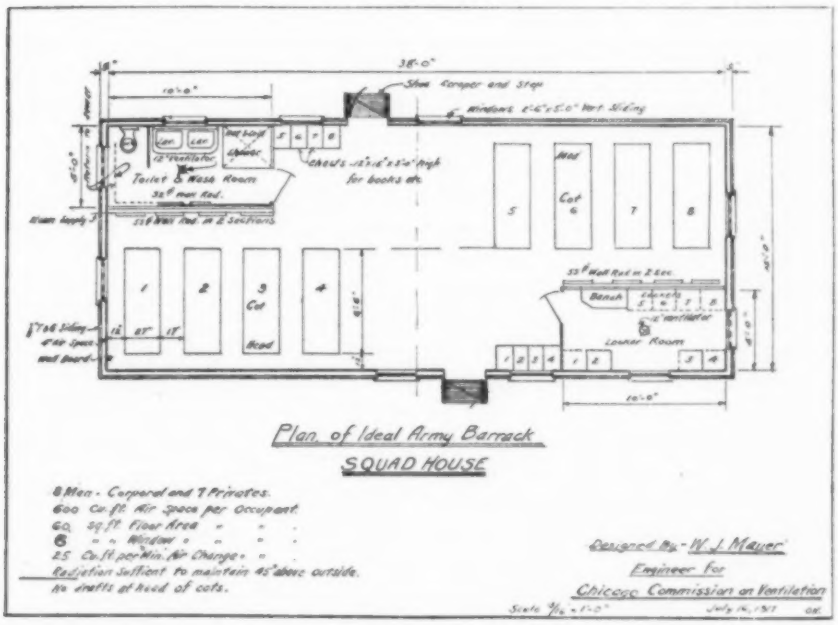
38'-0"
10'-0"
Stove Corner and Step
Windows 2'6"x5'0" Vert. Sliding
Toilet & Wash Room
Cot 6
Bench
Locker Room
Plan of Ideal Army Barrack
SQUAD HOUSE
8 Men - Corporal and 7 Privates.
600 Cu. ft. Air Space per Occupant
60 Sq. ft. Floor Area
6 " " Window "
25 Cu. ft. per Min. Air Change
Radiation Sufficient to maintain 45° above outside.
No drafts at head of cots.
Designed By - W. J. Mayer
Engineer for
Chicago Commission on Ventilation

Figure 7—Plan of Ideal Army Barrack Squad House.

this number, however, should be the maximum.

The *Squad House* shall contain eight bunks with a separate room for wardrobe at one end and toilets at the other. It should not be necessary for a man to leave the building for toilet or washing purposes. There shall be windows on all four sides of the squad house. A detailed drawing of the squad house as designed by the writer is shown herewith. It will be noted that with the arrangement of windows, radiators and cots no man will be subjected to drafts at his head. The allowance of window space, floor space and air space per occupant is that which is necessary for proper housing.

The *Temperature* shall vary from time to time between 45° and 55° unless the outside temperature is below 10°, under which condition 40° above outside temperature shall be maintained.

Heat shall be supplied from a central steam heating plant, with a proper amount of radiation in the squad house to furnish the above temperature and still allow the windows to be opened sufficiently to supply at least 25 cubic feet of air per minute per occupant.

The following shall be a minimum allowance per occupant: 600 cubic feet of air space; 60 square feet of floor area; 6 square feet of window area.

Dust shall not rise to more than 5,000 particles per cubic foot.

Bacteria count shall not be over 4 on a $3\frac{1}{2}$ inch Petrie dish exposed two minutes.

There shall be a 95 per cent freedom from *Odors*.

The *Windows* shall be double hung vertical sliding sash type, capable of being opened both at top and bottom so that the air may be introduced at a high point and may be thoroughly diffused before coming into the breathing zone.

The windows shall be on all sides of the building to secure a uniform *Distribution* of fresh air throughout the room. The sill shall not be less than 3 feet above the floor.

The *Cots* shall be uniformly distributed throughout the squad house and shall never be placed closer than 9 inches from any wall.

There shall be a separate room for the men's *Wardrobe* and a separate room for the *Toilet*, preferably at one end of the squad house, and care should be taken that the air supply to the sleeping quarters is not affected by these rooms.

All interiors shall be smooth finish and shall be *Painted* or *Limewashed* before occupancy and every three months thereafter.

Dust Pockets shall be avoided and care taken to keep the room free from dust and dirt.

The above scheme was worked out by the author and presented by him to the members of the Chicago Commission on Ventilation at their regular meeting on July 24, 1917, and received their unqualified approval.

THE CONTROL OF COMMUNICABLE DISEASES IN CAMPS.

MAJOR ISAAC W. BREWER.

Read before the Public Health Administration Section, American Public Health Association, October 20, 1917.

WE are now at war and a great wave of patriotism has passed over the country. Many people are making capital out of this war and we who are interested in the health of the people should not fail to capitalize this war to its fullest capacity. The enormous number of men who have been turned away from our army because of physical defects has called attention to the need of better things in the way of public health. We have before us, in the mobilization of this army, an unusual and very splendid opportunity for public health education. If we make the most of it the result of this war, as far as public health is concerned, will be good. If we fail to utilize the opportunity thus given, the public health movements of the country will lag as in the past. However, our education must, as far as possible, be logical in accordance with the best we know of the spread of the disease. My subject is on the control of communicable diseases in camp. A body of soldiers in camp offers an unusual opportunity for the control of diseases and at the same time soldiers living under these conditions are, to a very large extent, exposed to disease.

On table one are given the admission rates per thousand for the decade 1891 to 1900 and for each year from 1901 to 1915 for some of the communicable diseases which are common in the military service.

Measles.—During the decade from 1891 to 1900 the average admission rate was 10 91 per thousand. During the following decade it fell to 9.49 per thousand and, during the five years ending with 1915, it was 9.6 per thousand, a reduction of nearly 0.2 per thousand since 1900. Examining the individual year you will find that the rate varies greatly. For instance, in 1902 it was 14.41 per thousand. In 1908, it was 16.11 per thousand while in 1911 it was 17.29, the highest recorded during the period under consideration.

In the army the usual custom in checking an epidemic of measles has been to isolate each case as soon as it is discovered. The customs vary somewhat as to the contacts. In many instances they are placed in quarantine regardless of whether they have had the measles or not. In my sanitary work in the army during the past sixteen months, I have endeavored to handle this situation in what seems to me to be the more rational way. According to the studies made by Hill, it is probable that at the age of twenty years, 94 per cent of the men have had measles. The chances of the men having the measles a second time are not one in a hundred, therefore I feel that in handling an epidemic of measles, if we had a list of the men who have had the

TABLE I.

ADMISSION RATE PER THOUSAND OF COMMUNICABLE DISEASES IN THE UNITED STATES ARMY.

Year	Scarlet fever	Measles	Small pox	Mumps	Diphtheria	Cerebrospinal meningitis
Average, 1891 to 1900	0.14	10.91	1.06	7.24	0.55	0.26
1901	0.17	8.55	1.38	16.10	0.31	0.05
1902	0.22	14.41	1.30	15.80	0.26	0.07
1903	0.16	6.79	0.58	7.27	0.38	0.00
1904	0.00	14.42	0.34	10.23	0.19	0.00
1905	0.00	5.22	0.19	11.86	0.60	0.00
1906	0.00	6.41	0.27	17.91	0.30	0.09
1907	0.00	10.20	0.09	6.58	0.26	0.76
1908	0.00	16.11	0.23	12.22	0.92	0.26
1909	0.00	7.80	0.03	9.69	0.47	0.26
1910	0.00	4.96	0.21	3.65	0.85	0.14
Average	0.055	9.49	0.46	11.13	0.46	0.16
1911	0.10	17.29	0.07	14.46	0.63	0.00
1912	0.00	6.49	0.08	16.99	1.01	0.19
1913	0.00	6.44	0.10	7.85	2.98	0.43
1914	0.33	6.31	0.08	8.90	0.50	0.00
1915	0.74	8.71	0.05	8.02	0.88	0.36
Average	0.23	9.06	0.07	11.24	1.20	0.20

disease, we might very safely confine our attention to those who have not had the disease. If Hill's figures are correct, that would give us less than ten men per hundred to have under supervision. In some of the organizations that I have inspected the number of men who are not immune to measles by reason of a previous attack has been as low as 2 per cent. My custom is to parade the company in which the disease exists and make a hurried examination of every man, having him expose his chest and observing his eyes and mouth for symptoms of the disease. The men who have not had the measles are then separately paraded and their evening temperatures afterwards taken and recorded. The men having temperatures of not over 99²/₅ are examined again later on in the evening. Those who have temperatures above that are placed in isolation for three or four days until the danger of development of measles is past. The men who have not had the measles are kept under observation for fourteen days.

This plan has been carried out at Fort Ethan Allen, Vermont, during the recent mobilization of troops and, although we have had a number of cases of measles introduced by new arrivals, the disease has not spread beyond those who were first exposed except in the case of one regiment where the conditions were handled in another way and where the spread was probably due to faulty technique in the management of the cases. When this epidemic was brought to my attention, the plan here outlined was put in operation, and the disease rapidly disappeared. This plan produces a

minimum amount of inconvenience for the organization as it interferes very little with their training and has proven to be satisfactory to the line of the army as well as to the medical officers of the post. The work of taking the temperatures can very readily be entrusted to a hospital attendant and the medical officers need not spend more than five or ten minutes per day on this work.

Diphtheria.—The admissions of diphtheria in the army for the decade 1891 to 1900 was 0.55 per thousand. During the following decade it was 0.46 per thousand. During the last five years the admissions amounted to 1.20 per thousand. Examining the individual more closely, we find that the disease was more prevalent during the years 1912 and 1913. It is a well known fact that, although by the use of antitoxine we have been able to reduce the death-rate from diphtheria, most of our efforts to control the disease have been without avail. This is probably because of the large numbers of carriers in the general population. In my work in the army, I have endeavored to search out the carriers whenever a case of diphtheria appeared and I feel that the time and efforts expended on this have resulted in a considerable reduction of the cases. As soon as a case is reported as a suspect, I immediately get in contact with the other men who live in the tent or in the same squad room with the suspected case. Their throats are examined and those showing enlarged tonsils or symptoms of inflammation are isolated. Cultures are taken from all of the intimate contacts. This has resulted in the discovery of a number of carriers. In one outbreak that occurred in Texas about a year ago, I found in one regiment several carriers. All of these men were taken into the camp hospital and placed in isolation until negative cultures were obtained from their noses and throats. At one time we had in that hospital something like twenty-seven men who showed positive diphtheria cultures from their noses or throats. Not more than a half dozen of these had positive symptoms of the disease although most of them had enlarged tonsils. Those with diseases of the tonsils were operated upon and the others were treated by a number of different methods, the details of which I have not at hand at the present time. Strange as it may seem, all of these cases cleared up and were eventually discharged as cured of the disease. My present efforts for the prevention of diphtheria in this command consists of the following: At the semi-monthly physical inspection I have had the examining officers make lists of all men having enlarged tonsils. The tonsils in these cases are being removed as rapidly as possible, if the surgeon deems it advisable to do so, with the patient's consent. We have, by accident, found two positive cases of diphtheria in the command during the past six months and in both instances the infection resided in the tonsils and an operation resulted in a cure. We have also had one epidemic of Vincent's angina which was due to a carrier with enlarged tonsils. Removal of them also resulted in a cure. We did not have the facilities for determining the virility of the germs in

any of these cases. The Schick test should be used where possible.

Cerebrospinal Meningitis.—During my service in the army, I have had two experiences with cerebrospinal meningitis. The first occurred in 1899 and I had an opportunity of studying the pathology and the bacteriology of the disease with Dr. R. P. Strong. At that time very little was known of the method of spread and our efforts to control the disease were without avail. At about the height of the epidemic the troops entrained for San Francisco and only one additional case developed after leaving the post. I have always felt that the change from very much over-crowded barracks to the somewhat well ventilated train had more to do with the prevention of the disease than those measures adopted by the Medical Department.

During the past summer four cases of cerebrospinal meningitis developed at Fort Ethan Allen, Vermont. Before I knew of the first case, the entire organization to which the sick man belonged was placed under quarantine and an order was issued for the spraying of the noses and throats of each man with Dobell's solution. This was a very arduous undertaking and I felt at the time that very little was being accomplished. A few days later Major E. K. Dunham of the Rockefeller Institute arrived and he instituted measures of prevention which I think had a very decided effect upon the disease. He cultured all of the immediate contacts and found several who showed positive cultures. All of these contacts then had their noses and throats sprayed every two hours for eight hours with Dichloramine-T solution. These measures promptly sterilized the noses and throats of the men and there was no spread of the disease. We were unable to locate the original source of the disease but it seemed to me to be located amongst the troops at a certain portion of the garrison. Later, however, Dr. Amos informed me that further study of the cultures taken by Major Dunham showed that there were two distinct strains of the diplococcis, and it is probable that there were two carriers. Amongst the contacts of the first case was one man who had enlarged tonsils filled with a cheesy matter. It may be possible that he was the original carrier in the case. In cerebrospinal fever the point to emphasize is the treatment for the carriers and the sterilization of the noses and throats of all the immediate contacts with a solution of Dichloramine-T according to the formula of Major Dunham.

Scarlet Fever.—Scarlet fever is not a very large factor in the morbidity of the United States army. I think it should be controlled very much as measles, only the number of days of observation need not be longer than eight or ten.

Mumps.—Mumps cause the largest admission rate of any of these particular classes of disease. These are very difficult to control and the only method that has been to any avail, as far as I know, has been the isolation of such and quarantine the contacts.

In dealing with soldiers it should be remembered that his movements can be absolutely controlled and as a rule you have sufficient force and facilities for properly carrying on these lines.

PROPHYLAXIS OF INDUSTRIAL POISONING IN THE MUNITION INDUSTRIES.

DR. ALICE HAMILTON,
Hull House, Chicago, Ill.

Read before the Industrial Hygiene Section, American Public Health Association, October 18, 1917, at Washington, D. C.

I MUST begin my paper with an apology. The subject assigned to me, as I understood it, was the protection of workers in the explosive industries against industrial poisoning, not those employed in all the varieties of work that make up the munition industry in general. Therefore, I am not prepared to speak of that very important industrial poison, lead, nor of brass, nor arsenic, nor antimony, nor carbon monoxide—all of them, of course, present in the manufacture of munitions. I can speak only of the making of explosives, and not even of all of those for I see, to my relief, that the two following speakers are to deal with trinitrotoluene, so that I can spend the time allotted to me on the other explosives.

Nitrous fumes, under which term we group the various oxides of nitrogen, are the elements most to be feared in all nitration processes, including the manufacture of nitric acid. In nitrating cotton, starch, phenol, benzene, toluene, anilin, naphthalene, chlorbenzene, and other substances, there is a danger, more or less great, of an accidental escape of such fumes into the air of the work place. In my experience this danger is greatest in the higher nitration of cotton by the so called pot method, and in certain methods of nitrating picric acid, and in making tetryl or tetranitromethylanilin. Always nitration involves the formation of nitrous fumes but when it can be carried out, as it is in nitrating benzene to nitrobenzene and toluene to trinitrotoluene, inside closed receptacles, the danger is only of accidental escape of fumes. When an open method is used, the attempt to catch and carry off the fumes after they have escaped into the room is very difficult, I should think impossible. When such methods are used, sudden, violent decomposition with the evolution of dense fumes may bring about a most dangerous condition for workmen.

Nitrous fumes are corrosive and the symptoms which follow inhalation are due to this corrosive action on the mucous membrane of the mouth, throat, larynx, bronchi, and in severe cases the finer bronchioles. Congestion and swelling result, then an outpouring of an exudate, and there may be laryngitis with edema, bronchitis with dyspnea from the great swelling of the mucosa, pneumonia, or that dreaded edema of the lungs, familiar to every physician who has had charge of men on the nitrating area. Along with these symptoms there may be involvement of the gastrointestinal system, sometimes quite pronounced, but the respiratory distress is so much more

striking that it tends to overshadow all else. This form of industrial poisoning is so much like the gas poisoning in the trenches that the abundant medical literature on the subject of gassed soldiers might well be used for guidance in the treatment and in the prognosis of nitrous fume poisoning in industry.

Prevention of nitrous fume poisoning depends on the prevention of nitrous fumes. No respirator so far devised can serve to protect a man from these fumes, for more than a very short time. The sponge would have to be soaked in some neutralizing chemical and it would not be long before saturation occurred and the thing became useless. Helmets, of course, cannot be worn continuously, though it is recognized that helmets must be kept for emergency use in case of accidents on the nitration area.

Details as to methods of preventing fumes are impossible to give without making this paper unduly long. The more open the process, the greater the difficulty. If nitrated cotton must be dug out of the wringer and thrown into an open trough of water, there will be far heavier fumes than when this is accomplished by automatically discharging the wringer into a closed tank below. If picric acid is to be made by siphoning nitric acid into open pots of phenol, there will be much more danger than when the reaction takes place within closed nitrators.

But in nitration, as in the manufacture of nitric acid, no matter how well thought out the method is, accidents cannot be entirely prevented and they must be provided for. This means that access to the outer air must be easy from all parts of the nitrating department. In addition to the usual ventilation system there should be an emergency fan to suck out the dense fumes quickly. There must be an abundance of running water in case of acid burns. The workmen must be provided with some sort of mask, easily worn and adjustable in case of accident. I saw an excellent one in the du Pont plant at Hopewell. The men must be instructed in their own languages by a patient teacher who will take time to demonstrate what he is saying. Printed instructions on walls are doubtless valuable and many state laws require them, but even if the Italian or Slavic workman can read them he soon forgets and they cannot take the place of the spoken word. The instruction should include not only the ways to prevent and to deal with accidents, but the necessity of seeking medical care at once for even a slight case of fume poisoning. Every works physician knows how serious may be the consequences of imprudence following even mild fume poisoning.

Medical supervision is absolutely essential in nitration works and when, as is usually the case, there is no hospital near the works, a small hospital must be equipped on the grounds, provided with all that is necessary for the treatment of acid burns and "fume sickness." The doctor or his assistant must be within easy call.

In point of danger, I should put next to nitration (since I am omitting T.N.T.) the use of benzene and toluene, which may be treated together

since they are so similar in action. These compounds are encountered in the distillation of coal tar, in the manufacture of phenol, and in the manufacture of nitrotoluenes and nitrobenzenes. They are powerful narcotic poisons, rapid in action, sometimes producing death in a startlingly short time. I found fourteen cases of poisoning from them in 1916 in the explosives industry and seven of these were fatal, but in none of the seven was the exposure to fumes apparently great. Four of the seven were working in stills which had been emptied and washed out before they entered. Another was exposed less than five minutes to the fumes from a leak, and the two last were in the sulphonating department of a phenol plant where fumes arose from a residue of unchanged benzene running out from the sulphonator into a hot liming vat.

Certainly the greatest possible precautions should be taken in connection with all such work and far more careful cleansing of stills and storage tanks must be insisted on before the men are allowed to enter them. Some employers require the wearing of helmets during repairing and cleaning.

I have not found serious poisoning in the explosive industry from anilin or from nitrobenzene, not because these are not powerful volatile poisons, but because so far they are not used much in this industry nor in such a way as to cause dangerous exposure. We are told, however, that if we cannot get a larger supply of toluene for the manufacture of T.N.T., we shall be obliged to turn to that older explosive, dinitrobenzene, and then indeed we shall need all our skill to prevent danger to the workers, for it is more poisonous than T.N.T. and acts far more rapidly.

Tetryl and T.N.A. are not as yet in general use in this country, though I believe that the use of the former is increasing. Tetryl is tetranitromethylanilin and is used in the form of powder, or fine crystals or pellets. It enters into the composition of detonators and is usually handled by women and girls. When I made my study of the industry last year I found no trouble from tetryl more serious than a more or less distressing dermatitis, but since then I have heard from an American physician of experience that he has seen amenorrhea follow exposure to tetryl, and just recently I read a report from England of the opposite condition, profuse or too frequent or too prolonged menstruation among tetryl workers. As its use increases in this country we shall have opportunity to test both these observations.

For all these nitro and amido derivatives of the benzene series the preventive measures must include strict cleanliness and protection for the skin, since the skin is the chief portal of entry. The British experts insist on full suits of overalls, with snug wrist band and neck, clean socks and shoes in good repair, impervious gloves and of course ample washing facilities. I suppose it is a question whether American workmen could be induced to wear such overalls in our hot summer weather but if they are allowed to work with bare arms and necks in an atmosphere with poisonous dust, they must be required to bathe at the end of each shift.

Making smokeless powder involves exposure to ether fumes and requires a strong down draft system of ventilation, for the fumes are heavier than air. Making and handling fulminate of mercury carries with it the danger of fulminate itch, and probably also of mercurial poisoning. Here the problem is one of dust prevention chiefly and of bodily cleanliness.

All these methods of prevention are such as would present themselves to every intelligent works manager after he has had experience with the poison in question, but there are certain less obvious methods of protection that are equally important. One is the avoidance of over-fatigue. To say nothing of the effect of excessive fatigue upon the health of the worker in general, its effect in the poisonous trades is very serious. Fatigue lessens resistance to the action of poisons. In England the tendency is to provide against over-fatigue among workers exposed to industrial poisons, not so much by shortening the time spent in the factory as by interrupting work frequently, by inserting rest periods. Our habit in this country is different, our workers are accustomed to concentrating their tasks into as short a day as possible. Which is the more healthful system it would be idle to ask, for it is certain that the English way could never be introduced over here; we shall have to prevent excessive fatigue by a short work day. During 1916 I found the eight-hour day, the three-shift system, in general use. Two twelve-hour shifts were exceptional. Let us hope that it will be possible to maintain that rule during the war. We must remember that since many explosives plants are built far out in the country, the fatigue of the day's work may often be increased by a long ride standing up in a crowded car.

The length of the working day is important not only with regard to fatigue, but also with regard to the amount of the poison ingested. Obviously the longer the hours spent in an atmosphere of dust and fumes, the greater the amount of poison absorbed. To put a man to work for many hours stirring molten T.N.T. or cleaning out pans encrusted with dinitrotoluene, or shovelling chlorbenzene, is to court disaster. Shortening the hours then becomes an essential part of the prevention of industrial poisoning.

Heat increases the liability to poisoning in two ways, by increasing skin absorption and, as Helmholtz showed long ago, by favoring the action of the poison just as it favors all chemical action. In our hot summer months special care must be taken in those departments where poisons are present. I have in mind two T.N.T. factories which, during the excessive heat of 1916, adopted contrary policies. The one shortened the hours, introducing four shifts in place of three, the other started working the men overtime and kept it up into September. This last had more than double the cases of poisoning in July that it had in June, and the August toll was even greater, while in the other plant there was no increase during the hot months.

The British lay great stress on the importance of abundant hot, wholesome food for those exposed to poisons,

and I think all American physicians would agree with them. What they say of their workers is true of many of ours; they go to work in the morning after an insufficient breakfast and, therefore, ill equipped against poisoning, and the cold lunch carried to the factory is not nearly so good as a hot, well prepared meal. All British factories must now have what they call canteens, where hot food is sold to the workers, and in addition the employer is obliged to provide at his expense a pint of milk or of cocoa made with milk for each employee. Great pains have been taken by the Health of Munitions Workers Committee to work out proper dietaries and they have published full descriptions of these, with directions as to equipment, supplies, number of canteen workers needed, etc., for the instruction of the employer.

Medical supervision of employees exposed to poisons is an admitted necessity, yet I did not find it in force in all our factories in 1916 and some which were supposedly under the charge of a works doctor had no more service than was necessary to keep the company from troublesome claims for sickness, and death benefits. If medical care is to be adequate, the doctor must be actually in charge, not merely a consultant and not subordinate to the foreman. He must be responsible for the health of the men accepted for employment in these dangerous occupations; he must keep in close touch with them during their employment; he must know in which department a man sickened and what caused the sickness; he must see the men often enough to be able to pick out those not sick enough yet to come to him yet needing attention if they are to escape poisoning. He must also have the power to suspend from work or to shift to less hazardous work, and it must be for him to decide when a man once poisoned may return to his former job.

In this connection let me speak of the experience of some English works physicians in shifting a worker from a job which involved exposure to poison to one without this danger, but much more fatiguing or carried on in crowded, poorly ventilated quarters; such conditions have been known to actually precipitate the development of the latent poison, greatly to the discomfiture of the doctor who ordered the change.

We have not so far had to face the evil of immature labor in our factories making explosives and I hope most sincerely that we shall never commit the serious blunder of exposing boys and girls to poisons which, because of their immaturity, they are unable to resist. In all probability we shall employ increasingly large numbers of women in this industry but that does not seem to me to require any more precautions than does the employment of men except in cases where the poison is more dangerous to women than to men. This is, of course, true of lead, but I do not know of any poison in the manufacture of explosives that has a worse effect upon women than on men, unless it be tetryl. If the findings I have spoken of are confirmed, if it is proved that handling tetryl causes grave menstrual disturbances, then there will be reason to object to their

employment in tetryl works. On the other hand it seems to me possible that women may stand better than men the ether fumes in pressing and cutting smokeless powder, for they are so much less likely to help the action of the ether by indulgence in alcohol.

I hope we shall follow the example of the English, not only in our precautions against industrial disease, but in the matter of frankness, of the scientific spirit that gives gladly to the world all discoveries, all the knowledge gained by study and experience. The English have laid before us without reserve the record of disastrous accidents accompanying their manufacture of explosives, and for us as for them the information is of the greatest value. It would be a pity if American physicians were held back by any motive from adding their quota to the growing mass of knowledge concerning these new industrial poisons.

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Nutrition and Malnutrition.—At the suggestion of the medical officer of the London Board of Education the subject of nutrition and malnutrition was included in the school medical inspections during 1916. The results are reported briefly in the *Medical Officer* for November 17, 1917. The children were graded into four groups: good, fair, poor, wasting. Only 1,099 London children or 0.4 per cent of those inspected were placed in the fourth group. The weights and heights of a group of these children showed an average deficit, in boys, of 4.7 kilograms and 8.9 centimeters from the normal average for their age, and in girls of 6.2 kilograms and 9.7 centimeters. Younger children were more affected than the older, and boys were slightly worse at each age, than the girls.

Generally speaking the nutritional state of the children corresponds with their social conditions. An analysis of two districts showed some interesting results. Lewisham is a typical residential suburban district and Bethnal Green is one where poverty and overcrowding are more prevalent. The following table shows the comparison:

PERCENTAGE IN EACH GROUP OF CHILDREN MARKED GOOD, FAIR, AND POOR.

	Younger Boys			Younger Girls		
	Good	Fair	Poor	Good	Fair	Poor
Lewisham....	67.1	30.0	2.9	67.6	29.8	2.6
Bethnal Green	9.0	58.4	32.6	8.0	72.2	19.8
	Older Boys			Older Girls		
	Good	Fair	Poor	Good	Fair	Poor
Lewisham....	75.3	24.2	2.5	73.3	23.7	3.0
Bethnal Green	7.9	66.7	25.5	11.7	69.9	18.4

At the age of 11 the Jewish boys were considerably above the normal London average at 11 for weight, and still further above at 13, while the Gentile boys were slightly below the average at each age. With regard to height, however, the Gentile boys reached the London average at both 11 and 13 years, whereas the Jewish boys were slightly below the average at 11, and considerably above the average at 13. This would indicate that an important racial factor determined the rate of growth at each age, which also has an effect upon nutrition.

A comparison of 250 Jewish boys at each of the ages of 11 and 13 as compared with 250 Gentile boys at the same ages, from the point of view of nutrition, showed the following results.

	At Age 11			At Age 13		
	Good	Fair	Poor	Good	Fair	Poor
250 Jews.....	97	112	41	83	139	28
250 Gentiles..	53	143	54	77	143	30

(M. P. H.)

WHAT WE ARE DOING TO PREVENT TUBERCULOSIS AMONG CHILDREN.

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Read before the Section on Public Health Administration, October 19, 1917.

INTRODUCTION.

THE activities of the Department of Health, in the prevention of tuberculosis, have many points of contact and closely interlock with those of various private agencies. Definite and self-reliant, in large measure, as the organization of the Health Department's activities have in the process of evolution become, an account of its preventive efforts that omits adequate notice of the correlated work of many private organizations would lack completeness and would fail to do justice to the many splendid achievements of these and other unofficial co-workers.

While on the face of them, certain branches of our work hardly seem to fit in with a description of preventive measures directed particularly against tuberculosis in children, they are none the less upon consideration closely related.

It is impossible to do more than briefly mention the various measures which the New York City Department of Health, in common with other health organizations, has adopted to combat tuberculosis among children:

1. The inspection and the control of the milk supply by the Bureau of Food and Drugs, from its sources to its ultimate points of distribution is not only preventive of gastro-intestinal diseases, typhoid fever, septic sore throat, and other infectious diseases, but of tuberculosis as well. Pasteurization of milk, now mandatory in New York City, is a preventive of tuberculosis among children.

2. The fifty-nine Baby Welfare Stations maintained by the Department of Health for the dietetic and hygienic guidance and supervision of infants are also of value from the viewpoint of the prevention of tuberculosis. There, however, is a gap which exists in our work from this point. The pre-school age is one during which no effective periodic system of medical examination is conducted. Carious teeth, hypertrophied tonsils and adenoid tissue, and malnutrition in children who are not yet of school age, are justly to be regarded with apprehension as predisposing to tuberculosis quite as much as in those children who are of school age and who alone are now the objects of our solicitude. Periodic medical examination, regularly throughout life, must inevitably become one of the chief aims of public health work.

3. Parents of children must be taught by the printed and spoken word to give special attention to securing proper treatment and aftercare for those who suffer from measles and whooping-cough, diseases which are notoriously predisposing causes of tuberculosis.

4. The work of the Bureau of Child Hygiene, which has as one of its chief functions the periodic medical examination of school children, may justly be regarded as perhaps the most powerful and effective weapon with which the Department of Health wages its preventive attack on tuberculosis among children. The Bureau examines annually approximately 300,000 of the nearly 900,000 school children in New York City, to say nothing of its periodic routine inspection of all these children. Largely as a result of the activities of this Bureau, 160 school

children who have a positive sputum are excluded from attendance at public school at the present time, thus removing an important focus of infection. This work has resulted in the correction of important, predisposing factors, namely, carious teeth, hypertrophied tonsils, adenoids, anæmia and malnutrition, etc., in a large army of children.

5. The Bureau of Child Hygiene also exercises a fairly close and constant supervision over about 2,000 children who have been exposed to tuberculosis, or whose physical condition is such as to make them susceptible to the disease. These children, as a result of the coöperation of the Department of Education and the Committee for the Prevention of Tuberculosis, have been placed in "fresh air" classes, more than 80 in number at present. If these are good for the under-nourished and feeble children, why are they not equally necessary for all other children?

6. Finally, the Bureau of Child Hygiene examines children between the ages of fourteen and sixteen years who apply for working papers. This is an important and potent means of sifting out from among other physical defectives those who appear susceptible to tuberculosis as well as those who give evidence of an already existing infection.

Once again a gap appears in the work of the department, because its opportunities for continued oversight of children, into whose hands are placed working papers, ceases forthwith. The Health Department's supervision is not resumed until, as too often happens, the child, grown to maturity, seeks medical and even charitable aid of the community for the treatment and care of tuberculous disease, that is often lighted up by the unsanitary factory and shop environment into which the child steps when it receives its working papers. It would seem urgently necessary that the Labor Law, or its administration, should be so modified that a child should secure permission to work, subject to periodic reëxaminations by the Health Department, at regular intervals, or when about to enter a new shop or industry, and supplemented by a rigid industrial hygienic supervision of shops and factories employing children.

7. The examination of public school teachers who give evidence suspicious of tuberculosis, though it has not as yet been made a routine procedure applicable to all teachers, as it should be, has resulted in the exclusion of a number of actively tuberculous teachers.

8. School lunches distributed free to malnutrition cases are chiefly valuable as a palliative, as being symptomatic, and as focusing attention upon existing economic faults with the attendant evils of poor housing, over-crowding, filth, lack of sufficient and of proper food, and ignorance. No health officer is equipped to plan a broad and balanced campaign for the prevention of tuberculosis in children or adults, who fails to take into his calculations the influence of these factors, and to seek to forward his public health work while at the same time making manifest the need for solving the underlying social problems, and helping to forward this social program.

9. The twenty tuberculosis clinics of the Department of Health provide a means for the diagnosis, treatment and instruction of exposed children in families where tuberculosis exists, of children who show a susceptibility to it or who give suspicious evidence of the disease, and to malnutrition cases as well.

We have at present the following groups of children under our care in these nineteen tuberculosis clinics:

Active cases of tuberculosis of all kinds	1,335
Suspected or latent cases of tuberculosis	1,337
Exposed children	8,437
Children with positive sputum (all excluded from school)	160

It may be interesting in this connection to note that there was a total of 33,877 cases of tuberculosis of all kinds and in all age groups on register

in 1917 in the City of New York. Of this number, the 29 clinics which by reason of their conformity to certain standards of diagnosis, treatment, nurses' service and equipment, comprise the membership of the Association of Tuberculosis Clinics, treated 13,533 or nearly 39 per cent of all the cases on record; 2,672 or roughly 20 per cent of these were children. Since the number of active and suspected cases of tuberculosis among children was only 2,672, it will be seen that clinical care of the nearly 8,437 other children who were exposed or undernourished was distinctly a preventive activity. Things will be more as they should be, when the nurses who do follow-up home visiting for tuberculosis cases or to predisposed children are no longer overburdened with clerical duties, and are permitted, and compelled when necessary, to make themselves at home long enough to actually nurse the sick whom they visit, to give comfort to the patient and instruction to the family in proper methods of caring for the sick, to advise as to the proper selection and preparation of food and also as to the elimination of sources of infection, and to advise as to sick-room and personal hygiene.

Whether a case of tuberculosis in a child is diagnosed as one of pulmonary or glandular tuberculosis with fine exactitude does not much matter. Increasing vigilance to detect from among children of *all* ages those whose physical condition or exposure makes them susceptible to tuberculosis is the important thing, and it is better to err on the side of extending preventive care even to children who are free from tubercular infection.

10. The Department of Health has equipped two ferryboats to care not only for adults who are unwilling, unable, or delayed in entering hospitals or sanatoria, but for exposed and infected children as well. It provides a nursery, school and playground, as well as a midday meal, luncheon, nursing, and clothing for the children. Between eighty and one-hundred children are taken care of in this way. It is a great expense, considering its limited value, that justifies itself with difficulty, and only as it argues powerfully for a movement to induce Y. M. C. A. and similar organizations, hospitals, dispensaries and public parks to devote roof or park space respectively, where practicable, to accommodate the relatively large number to whom the present camps are inaccessible; then the overhead expense for food, nursing and medical care would be well worth the investment.

11. Institutional care has been provided at the present time in special tuberculosis hospitals for 350 active cases in children by the Department of Health.

Of the 350 cases, 104 are suffering from surgical tuberculosis; 243 are suffering from pulmonary tuberculosis; 33 are arrested cases. Institutional facilities for children are ample.

12. The segregation and forcible detention in the Riverside Hospital of the Department of Health of about 200 cases of those who will not or cannot observe proper care in the home, or of their persons, is deserving of more general adoption as a means of removing a potent and pernicious source of transmission of tuberculosis to children and others.

Voluntary entrance of tuberculous adults into public institutions, which would be desirable from the point of view of prevention of the spread of the disease to the children, is not as frequent as it should be. In 1916 a total of 1,543 tuberculous individuals of all ages entered hospitals and 697 entered sanatoria. The reasons for this are important, as hospitalization of active, sputum positive cases is possibly the most valuable way of reducing to an irreducible minimum the number of foci of infection in the community, in the manner that General Gorgas described this morning (October 19) the reduction of the

number of stegomia per acre as indispensable in the control of the spread of yellow fever. The elimination of each and every focus of infection is at present an unattainable ideal.

A certain number of patients will not stay in the best institution because of their desire for alcoholic and sexual indulgence, and because of their unwillingness to submit to discipline. The fight against alcohol is therefore not unrelated to the prevention of tuberculosis, and for a number of reasons that cannot here be printed.

Economic stress and the necessity to support the family keep many a wage-earner at work, and make him a source of danger in the home. Some day public health considerations, radical and visionary, as it may sound, will bring prominently to the fore some measures of relief, such as pensions or social insurance for the industrial soldier who is stricken in the line of duty.

Communities must primarily prevent tuberculosis by public health education and other measures of control, but until these become effective the problem of providing adequate institutional accommodations for tuberculosis carriers is a pressing one and a measure of prevention for children and others.

Finally, when we extol the architectural beauties and provisions a little less, and emphasize the necessity of satisfying, palatable and nourishing food and freedom from overwork for institution patients we will remove one of the causes that makes large numbers refuse to enter institutions, or to remain in them after they enter.

Private agencies have made available to our children the Preventorium at Farmingdale, and to our Catholic children the Nanuet Preventorium. Three hundred and twenty children are at present in these institutions for six months of reconstructive and defensive treatment.

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Study of Sanitation Urged for War Work.—In the *Boston Medical and Surgical Journal* for November 1, 1917, Professor Sedgwick of the Massachusetts Institute of Technology urges increased activity in preparing men and women for sanitary work in connection with the war. Opportunities are open for non-medical sanitarians such as sanitary engineers, sanitary chemists, sanitary biologists, and trained laboratorians, both in the Sanitary Corps of the Medical Department of the Army, and the Bureau of Sanitary Service of the American Red Cross. The question is also raised, whether the different schools that train men for public health and laboratory work, should not speed up, in order to turn out their product more quickly than usual.

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Tuberculosis in Dairy Cattle.—Prof. C. M. Hilliard says that although less than 1 per cent. of beef cattle are tuberculous, dairy cattle seem to suffer very much from this disease, particularly in the Eastern States. Thus, in New York, from 1910–1912, 19 per cent. of 39,330 cattle examined by the tuberculin test, reacted. During the last four years, about 11 per cent. of 29,000 tests on dairy cattle in Vermont, were positive. It is estimated that 30 per cent. of the cattle in Connecticut are infected, whereas the figure for Massachusetts is approximately 12 per cent. In other words, at least 10 per cent. of the dairy cattle supplying milk to infants, children and adults, are infected with a disease which is transmissible to man. The problem resolves itself under two heads. (1) The elimination of tuberculous cattle. (2) The pasteurization of milk.

The article appears in the *Boston Medical and Surgical Journal* for November 8, 1917.

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Medical Women and the War.—The National Medical Women's Association is attempting to obtain a list of all the medical women who can be relied upon for service in the war, should the need become apparent. The Surgeon-General of the Army is willing to place in base hospitals women physicians as anæsthetists, radiographers and laboratory workers. The need for laboratory workers is particularly keen at present and several courses have already been opened to college women in New York City and Philadelphia, to fit them as laboratorians.

STATE HEALTH DEPARTMENTS AND MUNICIPAL REFUSE DISPOSAL.

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Read before the Sanitary Engineering Section, American Public Health Association, October 18, 1917, at Washington, D. C.

IT is unnecessary, of course, to present any argument before a body of engineers to show that the collection and disposal of garbage is an engineering problem, but, judging from the methods commonly pursued by the governing bodies of our municipalities an educational campaign of considerable proportions must be carried on before the general public is made aware of the advantages to be gained by placing the question in competent hands for scientific study. As the matter now stands, the municipal health department is generally charged with the duty of enforcing the local garbage ordinance, if not with the actual work of collection. If the ordinance is wise in its provisions and the official in charge competent and active, fair results may be expected. But what was the origin of the ordinance and where did the supervising official get his skill and knowledge of methods? Undoubtedly both are the product of the exigencies of the local situation and perhaps each is as good as could be expected under the circumstances. But how much better might have been the result if the assistance of some central authority had been brought forward by the state at the proper time! It is probable that advice, based on experience to some extent, is available in most of the state departments of health, which might be made use of by municipal authorities if they knew of its existence. It is hardly to be expected that the official of a small community, elected for a short term and devoting but little time and attention to civic questions, will realize that the experience of similar towns may be obtained through the medium of some state department for his guidance in local affairs. The only way in which state assistance can be brought to the needy locality is by means of a state law, giving the state department of health supervision over the matter, and requiring certain duties of the municipality. Several of the states now have laws giving the state board of health supervision over sewerage systems and sewage disposal plants, which have been productive of much good in the elimination of nuisances and in protecting the public health by preventing the wholesale pollution of streams with untreated sewage. It would seem that a similar supervision over the collection and disposal of municipal refuse would result in valuable assistance to the locality in enabling it to solve its problems economically and in harmony with the best practice. If it did no more than to protect the municipalities from the unscrupulous vender of untried or worthless devices

it would accomplish enough to justify its existence.

A state law should be framed with three objects in view: First, to collect and dispense information and the results of experience for the benefit of all communities in the state; second, to provide means of raising money to carry on the work; third, to see that sanitary requirements are met in the prosecution of the work.

For the collection of reliable information it is necessary that regular reports be required from all municipalities, that such reports be made in standard form as prescribed by the State Board of Health, that they describe fully the methods used, and that they contain accurate cost data.

It is probable that in most states the expenditures of the cities and villages are subject to certain restrictions prescribed by state law, taking the form of a limit beyond which a municipality may not bond itself, and in some instances local charter provisions prescribe how much money may be raised by direct taxation and specify what it is to be used for. In either of these cases it is not impossible that the cost of the collection and disposal of refuse may be lost sight of in the consideration of the more usual municipal expenses. The state law, therefore, should enable and even require the municipality to provide money for sanitary improvements as well as for pavements, ornamental lights, parks and the like.

In order to see that sanitary principles may not be violated in carrying on the work the law should require that the methods to be adopted and the specific plans of procedure must receive the approval of the state board of health before the work is begun. The statute should also give the board power to order such changes in equipment or methods as may be necessary to prevent nuisances or protect the public health or even to require the installation of an entire system if the local circumstances are such as to demonstrate its need.

As an illustration of the chaotic state of the important work of garbage collection and disposal which would probably be found generally throughout the country, the following summary of the situation in Michigan in 1914 is given in the belief that conditions have not since changed materially.

In July, 1914, return postal cards were sent out to 210 municipalities in the state asking the following questions:

Do you have a system of garbage collection?
If so, who pays for the service?
Does the collection cover the whole, or only a portion of the corporation?
How often, and by what means is it collected?
How and where is it disposed of?
In case you have no system of collection, what becomes of the garbage in your community?

Data regarding Municipal Systems:

Total replies received	158
No garbage system worthy of consideration	103
Collection is paid for by municipal tax	32
Garbage is collected by private persons and the collector paid directly by the patron	21
Collection covers the entire city	30
Collection covers only part of the city	22
Dispose of garbage by feeding to swine	9
Dispose of garbage by feeding part to swine and burying the remainder	2
Dispose of garbage by feeding part to swine and dumping the remainder	3

Dispose of garbage by dumping on land	12
Dispose of garbage by burning it on the dump	11
Dispose of garbage by burial (including plowing it into the soil for fertilizer)	18
Fifty-one municipalities report frequency of collection as follows:	
Daily	2
Twice a week	7
Two or three times a week	20
Once a week	11
Every two weeks	1
Daily in business section, less frequently in residence	4
Once a week in residence, more often in business district	2
Once a week in winter, twice in summer	3
Once a week in business section, every two weeks in residence	1

Eight of the cities having municipal collection subsequently reported the percentage of population taking the service. The average of these eight is 60 per cent. Four cities having private collection reported an average of 28 per cent of the population taking the service.

The above figures bear out our previous observation that it is a fact that only a very small portion of the families have their garbage removed when they are compelled to pay the collector directly, and that the collection of garbage is much more general when its cost is spread upon the tax roll.

The collection of garbage is a community problem and affects the welfare of the entire municipality. Its cost should, therefore, be met by general taxation and every taxpayer compelled to assume his burden of the expense of keeping the city clean. It is of little benefit when one or two families in the neighborhood provide for the removal of garbage if their neighbors allow theirs to accumulate and become a nuisance and breeding place for flies.

Garbage, from its offensive nature, of course claims the attention of the municipality before the other waste products, but from the standpoint of the spread of disease, street cleaning is, no doubt, of first importance, and should certainly come within the scope of a state law enacted to cover all forms of city wastes. The lack of system and inefficiency noted above with regard to garbage collection and disposal would undoubtedly be found to apply to street cleaning were a similar investigation to be undertaken. To any one familiar with what is possible in this line the methods almost universally pursued are little less than disgusting and it would seem that state supervision is the only avenue by which material general improvement may be accomplished in cleaning streets with a minimum of cost and a maximum of sanitary efficiency.

PRACTICAL USES OF VITAL STATISTICS.

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VITAL statistics owe their existence to the commercial uses that have been made of them. In fact, vital statistics were called into being by the need of the practical information that they give, and their development into a separate science must be attributed to the increasing demand for data of the lives of the people for commercial, legal or other practical purposes.

While the greatest strides in the advance of vital statistics as a science have been made in recent years, their origin may be traced to centuries before Christ. Indeed, Herodotus tells us of a census of Egypt taken about 3050 B. C. for the purpose of making arrangements for the construction of the Pyramids. Elsewhere, this same author refers to a second census, taken about 1400 B. C. in Egypt by Rameses II, for the purpose of reapportioning all the land of Egypt among his subjects. The Bible tells us that Moses counted the tribes of Israel to determine their fighting strength and that David, about 1018 B. C., took a census for the same purpose. There is a record of a census taken in China about 1200 B. C., when data of the provinces was collected by Uking.

The first censuses made at regular intervals, of which we have a record, were taken in Rome after Servius Tullius. These were the most accurate enumerations of the population made in early times. About this period too, the residents of Rome were required to register births and deaths at certain temples in the city. It is probable that the purpose of this registration was to enable the civil authorities to determine the population of the city during intercensal years, as well as to have accurate data of the births and deaths occurring within the city, for legal and military purposes. It is even within the realm of possibility that the causes of death were studied from a sanitary viewpoint.

During the Middle Ages, enumerations were made from time to time, always with some specific purpose in view, which usually had to do with determining the fighting strength or the wealth of the nation taking the census. Particular mention is made in history of censuses taken by Charlemagne, William the Conqueror, Emperor Frederick II of Germany, and Edward II of England.

Sweden, about the middle of the seventeenth century, made it compulsory for the clergy to record not only the births, marriages and deaths, but also the populations of their parishes. The specific purpose of this registration is not disclosed. In Quebec a periodical census was established in 1665 and was continued until 1754. This was probably the first modern census.

The decennial census, which is an American institution, was brought into being by the provision in the Constitution for representation in Congress. The first one was taken in 1790 and was probably the first census in the broad sense of the word. The following is a quotation from the Encyclopedia Britannica:

"Sweden, Norway, and the United States are the only countries with any claim to have taken the first modern census, as distinguished from a register of taxpayers, etc. The lineal descendants of the old Roman census and the innovation seems to be due to the United States. If so, the first modern census was the American census of 1790."

In Great Britain, the first census was taken about 1801. The Encyclopedia Britannica states that:

"It was thought desirable to possess the means of judging from time to time the relations between an increasing population and the means of subsistence."

The same authority attributes to the essays of Malthus the desire for this information.

A triennial census was established in Germany in 1883 when it became necessary to have trustworthy enumerations of the population in order that the proceeds of the tariff might be justly divided according to the population.

It is, therefore, evident that the first vital statistics of which we have a record were enumerations of the population made for some practical purpose, *e. g.*, to determine the number of males available for military duty, to estimate the budget that could be collected through taxes, etc., etc. Save in Rome, after the time of Servius Tullius, we find no record of compulsory registration of births and deaths until rather recent times. In fact, today, in many parts of the United States, there is not an adequate system of registration of deaths, births and marriages.

Before the establishment by the federal bureau of the census of the registration area of births and deaths, the only means that the federal government had of securing mortality statistics was by including in each census an enumeration of the deaths that occurred during the previous year. I quote as follows from the published report of the ninth census, 1870:

"The dimensions attained by the life insurance interests within the past few years make it peculiarly a matter of regret at the present time that the census should not afford the data for determining with absolute precision and certainty the death-rate of the country, whether in the aggregate or by classes of population. This can never be done without a national scheme of registration, stringently enforced by penalties."

The first record of deaths in the City of New York is a list of persons who died of yellow fever in 1795, compiled for the purpose of sanitary investigation. In 1798 the deaths were recorded in a more or less careless manner because permits for burial were not issued by the city authorities, the certificate of death issued by the physician in attendance being presented by the undertaker to the keeper of the cemetery at the time of burial. The cemetery superintendents were charged with the duty of returning the certificates to the City Inspector's Department. That they discharged this duty in a rather unsatisfactory manner can be gleaned from an examination of the old records. Later, permits for burial were issued by the City Inspector but little if any improvement in registration of deaths was effected by this procedure as is evidenced in the following extract from the report of the Metropolitan Board of Health of 1866:

"The registration of deaths in New York City dates back to the year 1803. Cemetery records, and the returns of certificates of death through the cemetery-keeper or sexton, until within the last twenty-three years, supplied the information of deaths to the City Inspector. And until the adoption of new regulations, last spring, serious irregularities prevailed. *The frequent application for transcripts of death-records, which had never been registered, led to inquiries that confirmed and solved the question of incompleteness in the public registry.*

"The Metropolitan Board of Health has heartily sustained its Bureau of Vital Statistics in maintaining that "considered physically, the main objects of a correct civil registration of births, deaths and marriages, is to aid in disclosing the causes of disease; that, considered legally, the object

is to provide means of tracing descent and proving personal identity; and that, considered politically, it is to assist the government in arriving at correct conclusions with regard to measures of internal economy, employment, etc."

The authorities, realizing that such slipshod methods afforded ready opportunity of concealing homicide and suicide, changed the procedure so that permits for the burial of human remains would be issued only by the Registrar of Vital Statistics or his duly authorized representative, upon the presentation of a proper certificate of death. We quote from the report of 1866 as follows:

"In no other city in the world did greater need of such systematic and rigid rules exist. I am happy to state that no opposition has been shown to this rigorous system, though until the Metropolitan Sanitary Board ordered it into operation, the City Inspector's permits were to be had for the asking—ready signed and in quantity—at the shops of various undertakers and medicine venders in the different sections of New York City. Such a premium on the daily violations of the statute relating to interments and the sanctity of human remains was not to be tolerated; the Board of Health and its Bureau of Vital Statistics could not allow that vicious system to continue for an hour. The metropolitan police quickly gathered up and brought to headquarters all those unguarded burial permits. There were other and very gross evils connected with the custody and registration of the dead, which were promptly corrected."

The demands for transcripts of death certificates for court proceedings and for the collection of life insurance, also for the settling of estates, undoubtedly was an important factor in improving the registration of deaths. The first quotation from the report of 1866 refers to the influence upon registration by demands for transcripts.

The registration of births and marriages became compulsory in 1847, but as no penalty was provided for violation of the law, it soon fell into disuse. The necessity of providing a penalty in order that the law might successfully accomplish the purpose for which it was enacted became apparent, and after a period of several years the law was amended providing an adequate penalty. This amendment became effective on July 1, 1853, and after that the births and marriages were reported with a fair degree of regularity. We can assume that the need of complete registration of births and marriages, as well as deaths, was realized at least by the officers of the Board of Health because frequent reference is made to the matter in their reports. The following is an example of such reference:

"The state and the municipality open their account current and ledgers of the life, lineage, death and the causes of death of the people, in order that the laws of healthy existence and social welfare may be elucidated, while public registration is made of three great landmarks which nature has placed in the pathway of life. And if, in the transactions of trade and transfer of lands and estate, the civil government justly demands the formalities of deeds, of title-proofs, covenants and solemn oaths, and the literal registration of them, how much more and with what exactions shall the requirements of society be enjoined in regard to its care, study, and public records of man in his birth and lineage, his family, his offspring, and his death."

The biggest impetus was given to the registration of births when the Department of Education found itself unable to accommodate all the children that clamored for admission to school, and in order to reduce the number as far as possible, made a ruling that children would not be admitted to school until they had presented a birth certificate proving that they were of school age. Numerous other demands for tran-

scripts of birth, which are outlined in the following paragraphs, awakened the public to the necessity of having their children's births registered and created public opinion to uphold the recommendation of the Registrar, Dr. William H. Guilfoy, that all physicians and midwives violating the law be vigorously prosecuted. The adoption of this recommendation by the Department of Health has improved the registration of births in the City of New York until at the present time it is practically 100 per cent perfect. For this enviable record Doctor Guilfoy deserves credit.

Among the commercial uses of statistics in the City of New York, the following are the most common:

1. In Surrogates' Courts as proof of age and legitimacy of heirs. This is probably one of the most important legal uses of a birth certificate. Very recently in a case in this city in which many millions were involved, a birth certificate of the only heir was the most important evidence in defending an action to break the will on the ground that the heir was not born to the wife of the deceased but was a foundling which she had foisted upon him for the purpose of securing control of his entire estate at his death.

2. In Criminal Courts:

(a) To determine whether a minor defendant shall be tried in the Children's Court or in General Sessions.

(b) As proof of age of the complainant in cases of rape.

(c) As proof of birth in bastardy proceedings.

An interesting example in this connection of the value of a birth certificate to a person other than a child or its parent recently came to our notice. A young foreigner was arrested on a charge of bastardy and as he was unable to supply bail he was confined to jail until his case was called. The attorney who was assigned by the court to defend him applied to this department for a transcript of the record of birth of the child in question and was pleasantly surprised to find that the certificate showed the child to have been born in lawful wedlock to the husband of the complainant. It is needless to add that the complaint was dismissed.

3. In Civil Court:

(a) As proof of age in order to determine the validity of a contract entered into by an alleged minor.

(b) To determine the liability of a parent for the debts of a minor.

(c) In accident cases to determine the age of persons injured when the casualty company carrying the risk sets up the defense that the injured was under the age of persons permitted in their contract with the defendant to operate machinery.

4. Miscellaneous Uses:

(a) To settle disputes as to age arising out of insurance claims.

(b) As evidence upon which to correct a record of marriage or of death, particularly as to age.

(c) As evidence of legal age in order to obtain a marriage license.

(d) As evidence of age in order to enlist in the army or navy.

(e) As evidence of under age in order to obtain the discharge from the army or navy of boys who have enlisted without their parents' consent.

(f) As evidence of school age to gain admission to school.

(g) As evidence that a child is over 16 years of age and, therefore, does not require a permit to work.

(h) As evidence of the required age in order to obtain employment certificates between the ages of 14 and 16.

(i) As evidence of age and citizenship in order to obtain entrance to civil service examinations.

(j) As proof of citizenship in order to vote.

(k) As proof of citizenship in order to obtain a passport. This last need of a

birth certificate has been forcibly brought home to us during the present European war by accounts brought to us of hardships and dangers suffered by many Americans because of the failure of medical attendants to record their births. Indeed, several Americans arrested as spies were saved from imprisonment and possibly death only by proving their American citizenship by means of birth certificates obtained from this department. Had the physicians who attended at their births been neglectful of the important duty of reporting their births there is little doubt that their lives would have been forfeited because of such negligence.

(l) The Widows' and Orphans' Pension Law, which has just been enacted, has created a new demand for certificates of birth.

5. In health administration, birth returns, in addition to their statistical value, are almost indispensable in infant welfare work since they enable the health officer to get in touch with the mothers of infants within the first few weeks of life for the purpose of instructing and aiding her in the care of her child. Firms engaged in the manufacture of maternity supplies and of clothing, toys, carriages, furniture, foods, and other articles for infants are alive to the opportunities that birth returns furnish of getting in touch with a clientele interested in their products. In this city the law makes the birth reports confidential and for that reason such concerns are refused access to the records. In many communities, however, the birth records are open to the public and concerns such as those we have mentioned avail themselves of the opportunities which they offer.

Marriage Records.

In the Supreme Court:

1. In proceedings for divorce or separation the marriage of the complainant to the defendant must be established.

2. A record of a second marriage contracted while the first is yet undissolved is prima facie evidence upon which may be granted a decree of divorce of the first marriage.

3. As evidence of a previous marriage from which the defendant has not been released by divorce or death, in proceedings to annul a subsequent marriage.

In the Criminal Court:

1. As evidence of bigamy for the purpose of prosecution.

In the Surrogate's Court:

1. As evidence of marriage in order that a widow may obtain her lawful share of her husband's estate.

2. To prove legitimacy of heirs.

Miscellaneous Uses:

1. As evidence upon which to correct the civil condition of the deceased in a record of death.

2. As evidence of a widow's right to pension, under the Widows' and Orphans' Pension Act.

3. As evidence upon which a widow may obtain compensation for the death of her husband, as provided by the Workman's Compensation Act.

4. As evidence of the right of the widow of a soldier, sailor, policeman or fireman to receive a pension from the federal or local government.

5. As evidence upon which to change the record of birth of an illegitimate child. It is customary in the Department of Health of the City of New York, when the parents of an illegitimate child subsequently marry, to permit them to file a certificate of birth of such a child, from which it shall appear that the child is legitimate—as it becomes after the marriage of its parents under the provisions of the Domestic Relations Act.

Deaths.

Transcripts of deaths are used:

1. In the Surrogate's Court as evidence of death in probating a will.

2. As evidence of death of a parent in applications for appointment of a guardian.

3. As evidence of death of an heir.

In the Civil Court:

1. As evidence of death in accident cases.

2. To explain the non-appearance of a witness.

In the Criminal Court:

1. As evidence of the death of a defendant in order to secure the discharge of the bondsman who has given bail for his appearance.

2. As evidence of death in order to have an indictment against the deceased dismissed.

3. As evidence of death in prosecution for homicide.

Miscellaneous Uses:

1. As evidence upon which to collect insurance upon the life of the deceased.

2. As evidence of the cause of death in order to collect accident insurance on the life of the deceased.

3. As evidence of death of a beneficiary in applications to change the beneficiary of an insurance policy.

4. As evidence upon which to collect bank deposits of deceased persons.

5. As evidence of death of a subject ordered to report for military duty by those foreign governments which compel their male subjects to perform military duty.

6. As evidence of death in applications to the police department to remove the picture of the deceased from the Rogues' Gallery.

7. As evidence of death to be submitted to a city or other governmental department which has been paying a pension to the deceased.

8. As evidence of death to be submitted to the Workmen's Compensation Commission.

9. As evidence of death of civil or other pensioners in order that their widows or dependents may be granted one in its stead.

10. As evidence upon which to secure a widow's and orphan's pension.

11. As evidence of death of an illegitimate child in order that the father may be released from further payments for its care.

We have considered the past and present commercial uses of vital statistics, let us now see to what further uses the statistics of the lives of our people may be put.

In discussing the uses of statistics of mortality, the fact that life insurance, as a business, is absolutely dependent upon mortality statistics was not mentioned because the mortality experience upon which the life insurance companies construct their life tables and compute their charges are the mortality rates of their own clientele. But, if life insurance companies can amass fortunes for their stockholders, erect palatial buildings, pay large salaries to their officers and commissions to their solicitors, engage in social work, maintain permanent health exhibits, and engage in divers other activities requiring the expenditure of vast sums, by making practical and profitable use of the statistics they accumulate, why cannot cities and states likewise make practical use of their statistics and insure their residents against illness, accident and death. Not only should it be possible to do it at a saving to the public, but it should be possible to make sufficient profit to maintain the Health and Charity departments. At this point let us digress in order to express it as our conviction that these two departments should be consolidated as a Department of Public Health and the term "Charity Department" eliminated, for in the light of our present ideas it cannot be considered charity for a community to care for its ill, its aged and its poor, for if the social and economic life of our communities were properly organized, there would be none who could not care for himself or herself in illness and old age. Nor should it be

considered charity to provide for orphans and foundlings. On the contrary, they are among the most valuable assets of any community and it is but the wisest and best paying investment to see to it that their up-bringing and education is such that they will mature into healthy and, therefore, useful citizens.

The age of individual effort is past and we have entered upon one of coöperation; therefore, the care of our orphans, our ill, our aged and our poor might well be undertaken upon a coöperative plan until we have realized that Utopia where there will be no dependents.

Before proceeding to a consideration of any plan, let us first rid our minds of the old-fashioned notion that the function of a health department is or can be limited, now or in the future, to detecting and isolating persons ill of contagious diseases, correcting sanitary violations, or similar activities that formerly were thought to comprise the duties of an efficient health department.

Today we know that the salary a man receives has the most important bearing upon his own and his family's health, both mental and physical. His income determines the character of the premises in which they live, the quantity and quality of their food, the sufficiency or insufficiency of their clothing, the enjoyment of wholesome pleasures, and a hundred other factors that have a most direct bearing upon their good health and, consequently, upon their resistance to disease and their efficiency as workers. Likewise, the worker's earnings determine whether he shall be able to accumulate sufficient savings to care for himself in the event of illness and to provide for his old age. It is, therefore, apparent even to the casual observer that all these social and economic factors have a most direct bearing upon public health and are, therefore, matters that should be under the jurisdiction and control of the Department of Health.

The following conditions are indispensable to public health: a living wage; clean and well ventilated rooms; sufficient, wholesome food, properly prepared; adequate clothing; opportunities for relaxation in the form of wholesome amusements; prompt and efficient medical care and nursing during illness; sufficient revenue during illness, whether from accident or disease, to maintain the home.

Therefore, the major functions of a Department of Public Health should be:

First: To assist in securing a living wage for the worker.

1. By improving his health, which, of necessity, will increase his efficiency and, therefore, enlarge his earning capacity.

2. By urging educational authorities to provide practical courses of study that will develop the bent of each child, and, therefore, increase the productiveness of our future citizens.

3. By advocating that the worker be given his just share of the profits that his labor produces.

Second: To provide proper housing at home, in the shop and factory. This can probably be best accomplished by including within the organization of a Department of Public Health a Bureau of Housing which shall be charged with all duties relating to housing, whether tenement, dwelling, hotel, factory, office building, or department store. In this connection the idea suggests itself that taxes be reduced or eliminated on tenements renting at less than four dollars per room per month, provided they meet standard requirements, to be determined by the Department of Public Health. It might be possible in this way to induce capital to invest in model tenements, of which there is an urgent need in New York today.

Third: To care for the ill. This function can be efficiently and economically

discharged only by placing all the hospitals of the city under the direct control and supervision of the Department of Public Health. Attached to each hospital there should be an outdoor service which should include an adequate nursing force. Efficient ambulance service should also be provided and should be under the direct control and supervision of the Department of Public Health. Ambulances should serve all the hospitals of the city, each hospital being assigned a certain district. This would put an end to the present system of leaving it to the discretion of the hospital as to whether they maintain an ambulance service or not.

An important advantage of a city wide hospital bureau under the control of the Department of Public Health would be that the training school for nurses would also be city wide and the Department of Health hospitals would share in the services as well as in the teaching of the student nurses, thus increasing the practical work and training of the nurses and improving the services of the Department of Health hospitals without additional expense to the city.

Fourth: To care for orphans and foundlings. That children are foundlings or orphans makes them no less valuable to the state if they grow into manhood and womanhood, healthy in mind and body, and no less a burden if they become mental and physical defectives. Therefore, their care should be centralized in the Department of Public Health and the institutions to which they are entrusted should be located, as far as possible, outside the city limits in order that they might secure all the benefits accruing to children raised in the country.

Fifth: To provide suitable homes for the aged poor where they can be decently housed. The Farm Colony probably best solves this problem, combining as it does the advantages of outdoor life and the opportunity for making practical use of such labor as the inmates are able to perform.

Sixth: To accumulate data of the lives of the people that will enable the Department of Public Health to properly direct its activities and to compute the cost of compulsory insurance against accident, illness and death. In this connection it might be mentioned that the Department of Health of the City of New York has accumulated mortality statistics for more than one hundred years and from these statistics, together with the census enumeration of the city, the department recently constructed life tables of the citizens of the city, and is, therefore, in a position to compute life insurance rates.

It seems reasonable to suggest that the city could afford to insure its residents against illness and death at premiums lower than those offered by any insurance company in existence today and still make a profit sufficient to maintain a Department of Public Health. Such a system would impress upon everyone the value of one's own health and life and, furthermore, it would give everyone a direct and monetary interest in the health and life of every other resident of the city, as well as in the efficient management of the Department of Public Health. It would seem that in this way the hearty aid and coöperation of everyone could be obtained.

A program such as the one here outlined may seem utopian and possibly socialistic, but just as we have advanced from that era of public health work when stagnant water was thought to be the cause of typhoid and night air the cause of malaria, so too must we come to this broader realization of our duties as a community and, accordingly, extend the functions of our Department of Public Health.

COMPARATIVE WASSERMANN TESTS WITH TWO ANTIGENS.

ANNA I. VAN SAUN AND MARGARET K. PRESTON,
New York State Department of Health, Division of Laboratories and Research.

Read before the Laboratory Section, American Public Health Association, October 20, 1917, at Washington, D. C.

A GREAT deal has been said and written concerning the relative merits of various antigens used in the performance of the Wassermann test. Wassermann's original saline extract of syphilitic tissues, Noguchi's acetone insoluble fraction, crude alcoholic extracts of normal tissues, and cholesterinized extracts of normal tissues have been among the most frequently used by different investigators. Within the last few years a number of serologists have confined themselves to the last two mentioned antigens and many interesting articles have been published concerning the results of their tests.

At the inception of the sero-diagnostic work three years ago in the state laboratory, it seemed to us that, considering the variability of results obtained with the Wassermann antigens, even when these antigens were made by the same method, the use of at least two antigens would constitute a valuable check on diagnostic tests. Accordingly, the director required that two antigens made after two different methods be used for every specimen of serum received for the Wassermann test. This requirement removed to some degree the possibility of error in losing a reaction with a serum from a syphilitic which might be too deficient in antibody content to give a reaction with one antigen, but which might give the reaction with a more sensitive antigen.

One also finds that a certain percentage of sera may give doubtful or non-specific reactions with very sensitive antigens such as those containing cholesterin; so that antigens made with and without this constituent would seem to complement each other more nearly than those made by other methods.

Not only was the central laboratory required to use two antigens for diagnostic tests but also laboratories throughout the state which coöperate with the state laboratory were requested to observe the same precautions.

For the past three years we have tested in the state laboratory more than 25,000 sera with antigens made after two different methods; one a crude alcoholic extract of beef heart, the other a cholesterinized extract of guinea pigs' hearts.

The following report is based on a tabulation of those tests which were made in 1916.

More than ten thousand specimens were received during 1916 by the Department of Serum Diagnosis for the Wassermann test; 9,394 of these specimens were tested with the two antigens. Occasionally specimens were received which contained too small an amount of serum for two tests. A number of spoiled or otherwise unsuitable specimens were also received on which no tests were made.

The anti-sheep hemolytic system was used and the pooled sera of at least three guinea pigs. All reagents were standardized daily, and patients' sera and antigens were carefully controlled. In the case of the crude alcoholic extract of beef heart complement was fixed at ice box temperatures of 8° to 10° C. while with the cholesterinized extract of guinea pigs' hearts fixation took place at a water bath temperature of 37° C.

Readings were made according to the method advocated by Citron. After the tests were read the results were carefully compared with the histories of the patients which are usually quite complete and on those sera which had given paradoxical reactions (of which there were comparatively few) tests were repeated on the following day to make sure that such reactions were not due to a technical error.

The results with eighty-one per cent of the tests coincided. Twenty-nine sera were positive with the crude alcoholic antigen and negative with the cholesterinized antigen. Twenty-eight were positive with the cholesterinized antigen and negative with the crude alcoholic antigen, one showing no advantage over the other in this particular.

Of those positive with the crude alcoholic antigen and doubtful with the cholesterinized antigen there were 314 against 165 giving a positive reaction with the cholesterinized antigen and a doubtful reaction with the crude alcoholic antigen. The latter antigen thus gained 190 per cent more positives in this class of reactions than did the cholesterinized antigen.

The greatest variation in results was in the number of slight or doubtful reactions with the cholesterinized antigen which were negative with the crude alcoholic antigen. Of these there were 1,113 or 12 per cent of the total tests made on the same specimens of serum. The above results are compared in Table I.

Basing the percentage of positive, negative and doubtful reactions on those obtained with each antigen taken separately we find that approximately 24 per cent of the sera were positive with the crude alcoholic antigen as against 22 per cent with the cholesterinized antigen. Sixty-seven per cent were negative with the crude alcoholic antigen and 57 per cent with the cholesterinized antigen. Eight per cent were doubtful with the crude alcoholic antigen and 20 per cent with the cholesterinized antigen.

TABLE I.

Comparison of Results of Wassermann Tests with Two Antigens.

		BIII*		
		Pos.	Neg.	Doubt.
FI*	Pos.	1917	28	165
	Neg.	29	5231	98
	Doubt.	314	1113	499

Read horizontally the figures refer to the results obtained with FI.

Read vertically the figures refer to the results obtained with BIII.

*BIII Crude alcoholic extract beef heart, FI Cholesterinized extract guinea pigs hearts.

TABLE II.

Percentage of Results Obtained with Both Antigens.

	BIII	FI	Per cent	
			BIII	FI
Positive	2260	2110	24+	22+
Negative	6372	5358	67+	57+
Doubtful	762	1926	8+	20+

These results are presented in Table II.

It has been frequently demonstrated by many serologists that no two lipoid extracts made after either of the two methods described above or any other methods are ever quite alike. It is the usual custom to try out a new antigen in as many comparative tests with a standard antigen as possible before placing any dependence upon the results obtained with it. It should as nearly as possible approximate the results obtained with the standard antigen. We, therefore, feel that since these variations exist, reports on Wassermann tests performed with two antigens may be more

safely made than reports on those performed with but one antigen.

Confirmation of the result of a test with one antigen by an equivalent reaction with another is also of great value where no clinical evidence can be secured.

In our experience the crude alcoholic antigen with the ice box method of fixation has given the most reliable results with the majority of the sera tested and also in those cases where paradoxical reactions occurred, although the cholesterinized antigen, if used with the care which its anticomplementary quality demands, will give satisfactory results and is of value in demonstrating the success of anti-syphilitic treatment and for other comparative purposes.

We consider a cholesterinized antigen exceedingly unsafe to use if the results obtained with it are not controlled by those obtained with a crude alcoholic antigen.

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DIPHTHERIA IN COURT BIBLES.

HOMER N. CALVER,
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KISSING has before this been condemned by many as dangerous—certainly, that is, from a sanitary standpoint. Yet one of the oldest laws in the State of North Carolina makes it obligatory in certain instances, namely for those taking oaths. This law says "Judges and Justices of the Peace and other persons who may be empowered to administer oaths shall require the party sworn to lay his hand upon the Holy Evangelists of Almighty God in token of his engagement to speak the truth—; and he shall kiss the Holy Gospel as a seal of confirmation to the said engagement." Such a manner of taking oath has undoubtedly a strong psychical effect and may in many instances decide the question of truth in the mind of a court witness. For it is in court that probably the majority of these oaths are administered. Nevertheless, even this form of kissing would seem to be an excellent manner of transmitting certain diseases.

With the object in view of obtaining some evidence in support of this theory a few cultures were made from the Bibles used in the two courts in this city. The cultures were made on tubes of Loeffler's blood-serum media or on blood agar by rubbing a sterile swab moistened in sterile water over a portion of the outside of the Bible and inoculating the media therefrom. All swabs were taken immediately on adjournment of the municipal or the county court and those in the former made on Monday mornings when there is generally an unusually heavy docket. After incubation for from twenty to twenty-four hours smear diagnoses were made. All smears being stained with Kinyoun's stain, this stain bringing out even better than Loeffler's the granular characteristics of the diphtheria bacillus. Both the media and the stain therefore were devised to show diphtheria if present, and the finding of this organism was in truth the principal result of these tests.

The first series of six swabs was taken on March 12 from the two Bibles (one for white and one for colored) used in the city court, and cultured on Loeffler's media. Smears from one of these showed a practically pure culture of B. diphtheriæ and a second from another part of the same Bible (the one used by whites) showed B. diph-

theriæ in mixed culture. The second series taken from these same Bibles on March 26 on Loeffler's media and on blood agar showed but one smear positive for diphtheria out of eight swabs taken. This one was again practically pure culture and from the same Bible as in the previous series.

In the county court in order to expedite the swearing of witnesses there are provided a larger number of Bibles. Four of these were selected and marked for culturing. In the first series of six swabs taken in this court on March 14 the cultures were made on Loeffler's media. Two of these cultures, both taken from Bible "A" showed B. diphtheriæ in pure culture. On March 26 the superior court was sitting in the county court room and on this date three additional Bibles were selected, marked and cultured with three of those cultured previously all of these being cultured on Loeffler's media and on blood agar. Bible "A" which showed positive before showed no diphtheria this time, either on blood agar or on Loeffler's media and but one of the twelve cultures from the six Bibles showed B. diphtheriæ and that in mixed culture on serum media from Bible "D."

In these four series of swabs, thirty-two cultures were made from nine Bibles. Six cultures and three Bibles showed diphtheria. Of these three Bibles, the Bibles for whites in the city court showed it in two cultures taken two weeks apart. Bible "A" showed it in the first culture but did not in the second culture twelve days later. Bible "D" did not show it upon first culturing but did twelve days later.

The diphtheria organisms found were principally those of Westbrook's types c, d, cl and dl; though c2 and d2 were found also. Most workers agree that the first two types are virulent and opinion on the others is divided, however virulence tests of the organisms of these classes isolated from the Bible covers were all negative.

REPORT OF THE COMMITTEE ON STANDARD METHOD FOR THE PREPARATION OF TUBERCULIN.

Presented before the Laboratory Section, American Public Health Association, October, 1917, at Washington, D. C.

A LIST of questions covering all details of the preparation of old tuberculin has been sent to all laboratories making old tuberculin. For the past two years experiments have been made with a view to simplifying its preparation and while the results are not yet ready for publication it can be announced that a standard method will soon be recommended.

Owing to the fact that there are no standard methods for determining the potency of old tuberculin, it is strongly recommended that hereafter all lots be tested by the following tentative plan. Immediately before releasing the tuberculin for distribution suitable dilutions shall be made in sterile salt solution so that 0.1 cc. shall represent 0.00001, 0.000001, 0.0000001 and 0.00000001 cc. tuberculin respectively, and then 0.1 cc. of each solution shall be injected intradermally by the Mantoux method on the inner surface of the forearm of a known tuberculin sensitive individual.

A standard tuberculin will be supplied by the committee for determining a proper test subject. No tuberculin which fails to give a characteristic and positive reaction in a quantity one decimal point less than the standard tuberculin shall be released for distribution.

(Signed) BENJAMIN WHITE.

THEORY *vs.* PRACTICE IN VITAL STATISTICS.

A REPLY TO PROF. W. F. WILLCOX.

T. D. TUTTLE, M. D.,
State Commissioner of Health, Seattle, Washington.

Read before Public Health Administration Section, October 18, 1917, at Washington, D. C.

IN THE June issue of this JOURNAL, Professor W. F. Willcox publishes a reply to a paper read by me before the American Public Health Association at Cincinnati, October 27, 1916, and published in this JOURNAL in the issue of April, 1917. As Professor Willcox advances certain theoretical arguments in contradiction to my findings, I feel that I am justified in offering the readers of this JOURNAL a reply to Professor Willcox's criticism.

On page 562, column 2, Professor Willcox states: ". . . the hearing transferred to a jury composed mainly of physicians, few of whom probably have been trained in vital statistics." It is evident that Professor Willcox is not aware of the fact that a fairly large per cent of the membership of the American Public Health Association are not physicians and that its membership includes a large number of men whom most of us would designate as "statists." But the question that I mainly challenge is the statement that the physicians who are members of the American Public Health Association have had no training in vital statistics. I hold that these physicians have had the very best possible training, because their training is of a character that takes them into the field. They know the actual difficulties encountered in collecting death records. Their work is not theoretical, it is practical, and they know absolutely whether or not they are getting the death returns because they are there and can see. Dr. Cressy Wilbur is a "physician," but some of us, at least, had a very high respect for him as a statistician.

In 1916 Doctor Wilbur was sent to Washington by the Federal Census Bureau to investigate the enforcement of the registration act in Washington. Doctor Wilbur's report has not been published, so far as I know. I regret that Professor Willcox has not had an opportunity of reading this report. Doctor Wilbur made a thorough investigation of the workings of the registration act in Washington, and I am of the opinion that it was as a result of Doctor Wilbur's report that Professor Willcox's suggestion of 1915, based purely and simply on theoretical findings, was not carried out by the Census Bureau.

On page 563, column 1, Professor Willcox asks: "Let me ask first, How small a death-rate will be accepted by experts without suspicion that it is inaccurate?" I do not know how small a death-rate would be accepted by the theoretical statist, but I do know how small a death-rate would be accepted by the practical field man; namely, that death-rate which resulted from a

known complete death return, this knowledge being based on actual investigation by a trained collector of vital statistics. This and this only is the proper foundation for determining a death-rate in any locality. It may not meet text-book ideas but it results in cold-blooded facts.

On page 564, Professor Willcox selects the year 1910 as a basis of population without flaw, because the census was taken in 1910; and yet, on page 568, he states very positively that the census of the State of Washington was very badly padded. How does he make these two statements conform with the idea of securing an absolutely correct death-rate per thousand population?

I acknowledge his criticism in the latter sentence of Par. 1, column 2, page 565, but as I stated in my argument, I eliminated both deaths and populations of unknown ages, as I was not conducting a guess work study. Such guess work must be conducted by the theoretical statist and not by a field man.

On page 568, column 2, Professor Willcox states: "But errors in an enumeration are far easier to detect than errors in the registration of deaths. . . ." Theoretically this may be true, practically it is not. Returns in collecting deaths can be absolutely checked. With 425 registration districts in the State of Washington, covering the entire populated portion of the State, we can check to a fairly accurate degree whether or not the records of all deaths are being secured. It is certainly a more simple matter to count the dead ones than it is to count the living ones, for even in England there are more live ones than there are dead ones. I mention England because Professor Willcox mentions England only as a basis of death returns. He seems to have forgotten that there are other countries in which conditions more accurately correspond to those in Washington.

With regard to inaccuracies of the United States Census Bureau's method of estimating population, Professor Willcox and I heartily agree, as shown by the following quotation, column 1, page 569: "Any method which assumes that the population grows regularly is bound to be a misfit when applied to a population which grows irregularly, as it does in the far western states, and many estimates of population, therefore, especially for the latter years of a decade, are bound to be wide of the mark." I agree with Professor Willcox in this statement, and would add also that they may be wide of the mark in the earlier years of the decade, especially when such unusual conditions arise as did in the extreme northwestern states and British Columbia from the early part of 1909 to the end of 1912.

Whether the method suggested by me would furnish a more practical method of estimating populations, can be determined only by actual experience and not by theoretical argument. The fact that an unusual outbreak of disease would apparently upset this does not contradict my theory, because I plainly state in my article, which Professor Willcox fails to mention in his quotations, that an unusual outbreak of disease would necessitate

a close coöperation between the field man (the health officer) and the office statistician. Such coöperation would correct any error arising from an unusual outbreak of disease.

The whole question revolves itself into the old saying "The proof of the pudding is in the eating." In my study I took into consideration six states. I said that the population in Washington and Oregon was overestimated. The registration of men for the United States Army clearly demonstrated this to be a fact. I stated that the population in Indiana and Michigan were underestimated. The returns of the army registration demonstrated this to be a fact. I stated that the estimated population of Connecticut was very accurate. Note the confirmation of this statement by the registration returns. Finally, I stated that the population of Massachusetts was probably overestimated. The returns would contradict my findings in Massachusetts. In other words, my "guess" met the conditions in five out of six instances. Incidentally, in regard to Massachusetts, I stated that it was possible that the public health work in Massachusetts had resulted in a greater reduction in deaths in that state than might be apparent; that is, that the public health work influenced the death-rate in non-preventable diseases more than I had given credit in my studies.

I do not for an instant pose as an "expert statist." I am just a mere doctor, but having devoted a little more than fifteen years in collecting the data on which the "expert statist" bases his conclusions and from which he spins his more or less delicate theories, I feel that I am justified in saying that, in my very humble opinion, Professor Willcox has based his conclusions on some erroneous assumptions. First, he assumes that his conclusions have been challenged. I plead guilty to ignorance, more and more every year, but the fact is I never heard of Professor Willcox or his conclusions until the day I read my paper at Cincinnati last fall, when a friend of mine asked me if my paper was a reply to the statements made by Professor Willcox. In the second place, Professor Willcox in his arguments uses a stationary population as a basis of argument. There is no stationary population in Washington, hence, any argument that applies to a locality where there is a stationary population cannot apply to the State of Washington. Finally, Professor Willcox flatly charges that the death returns in Washington are incomplete and that a death-rate of 10 per thousand for the State of Washington is absurd. Instead of making an actual investigation with regard to the death returns in the State of Washington, upon which the death-rate is based, he attempts to prove his assertion by technical arguments—so technical as to suggest reference to authorities on mortality tables, such as Professor Glover, Dr. Frederick L. Hoffman, etc. At my suggestion Doctor Hoffman was good enough to read my original article long before the same was considered suitable for presentation before the American Public Health Association, and subsequently thereto he has, not only on his own part reviewed

the arguments brought forward by Professor Willcox, but he has had the same subjected to critical consideration by Mr. Knud Stoumann, one of his statistical assistants with experience in Danish and English statistical offices. I, therefore, give Mr. Stoumann's conclusions concerning these questions rather than my own, but, of course, in a much abbreviated form on account of the limitations of time.

According to Mr. Stoumann: "The main argument of Professor Willcox is that the death-rates of the State of Washington when applied to a 'stationary' population give an abnormally low death-rate and an apparently absurd average duration of life of 70.3 years. This expectation of life is arrived at by applying the Washington state death-rates by sex and age to the 'stationary' population corresponding to the life table of 1909–1911 for the original registration states and computations by Professor Glover of the University of Michigan. By dividing this standard death-rate into one thousand Professor Willcox obtains an apparent average duration of life which in text-books is commonly designated as the expectation of life at birth.

"The true expectation of life at birth, as, of course, is well known, can be obtained by dividing one thousand by the death-rate per thousand standardized for age and sex constitution on the basis of the 'stationary' population derived from the same population and mortality sources. It is extremely dangerous in statistical practice to utilize a 'stationary' population for one area or country as a test as to the accuracy of the mortality returns for another area or section, for reasons which do not seem to require extended explanation. A stationary population is a population where the number of deaths equals the number of births, which, of course, in actual practice never precisely occurs anywhere, although an approximate stationary condition of the population may be reached, as for illustration in France, and apparently among our American Indians. Such a stationary condition is possible whether a mortality rate is high or low and without regard to the portion of life which may be subject to the most severe strain or stress of mortality as conditioned by lack of disease resistance. A number of stationary populations varying in degree and kind are thus possible, and since the standard death-rate depends upon the standard selected the expectation of life at birth would thus vary according to the particular stationary population used. Since it is readily conceded that population and mortality conditions in Washington vary quite considerably in nature and degree from those of the old registration states which form the basis of the Glover life tables, it is self-evident that such a stationary population as is therein used should not have been used by Professor Willcox in ascertaining the theoretical accuracy or inaccuracy of the Washington mortality returns.

"Unfortunately the true expectation of life can be computed only by the slow and laborious but mathematically correct actuarial methods. The application of such methods is ex-

tremely difficult in the present case since all life tables assume a normal population flow or a fairly stationary condition of the population as to settlement, migration, immigration, etc., which, of course, is not the case with the State of Washington where conditions as yet are far from having reached maturity. If, however, the method used by Professor Willcox in computing the expectation of life at birth is applied, for illustration, to Australia, it appears that the expectation thus determined is 70.4 years, although the life tables for the commonwealth computed by thoroughly trustworthy mathematical methods give the true value at about 57 years, or about 13 years less.

"On this fallacious assumption, therefore, the main attack against the Washington data is made by Professor Willcox and the plea is advanced that the state should be excluded from the registration area. Such action would indeed be a wrongful procedure in view of the splendid effort which has been made by the Washington and Oregon health officials to secure complete registration of deaths even in the most remote and sparsely settled counties of their states. In order to make the point involved entirely clear a life table has been constructed for the State of Washington by Mr. George King's well known and recognized method of constructing an abridged life table, which gives entirely trustworthy values from the age of 12 to well-advanced years, for at extreme ages the numbers are almost invariably too small for safe conjecture and trustworthy methods of random sampling. An attempt has not been made to determine the values for the early years of life, since these are invariably uncertain, even when the returns are absolutely complete, on account of the effect of wide variations in infant mortality, immigration, population composition, etc. For the present purpose the three years, 1909–1911 have been used, since these are the years employed in the Glover life tables, based on the United States Census. The results of these computations for specimen ages, according to sex, are hereto attached in Tables I and II. The value of life tables for a variety of purposes is easily exaggerated. The expectation of life or the average duration of life is a function frequently without real importance and often seriously misleading. Particularly uncertain is the expectation of life at birth, and since Professor Willcox limits most of his considerations to this value, which is strongly influenced by the high mortality during the first years of life, his conclusions are further impaired in scientific value. The expectation at birth requires to be used with the same extreme caution for general purposes as the crude mortality rates covering all ages and a wide range in sex, race, nativity, occupation distribution, etc.; only observation of the peculiar local changes of the mortality curve by age, and a minute scrutiny of its constituent parts will justify at least approximately trustworthy final conclusions.

"The expectation of life is somewhat more satisfactory or trustworthy when the uncertain age of infancy has been passed or been eliminated. In Table III, therefore, the expectation

TABLE I.

PROBABILITY OF DYING INSIDE OF ONE YEAR IN THE STATE OF WASHINGTON; BASED ON ESTIMATED POPULATION DISTRIBUTED ACCORDING TO THE CENSUS OF 1910, AND THE REPORTED DEATHS 1909, 1910 AND 1911.

	Male				Female			
Age	Graduated population	Graduated deaths	Mx	Qx	Graduated population	Graduated deaths	Mx	Qx
12	28,287	71	.00251	.00251	27,700	69	.00249	.00249
17	31,202	129	.00413	.00412	28,900	102	.00353	.00352
22	44,408	216	.00486	.00485	30,116	147	.00488	.00487
27	47,701	235	.00493	.00492	29,378	151	.00514	.00513
32	39,862	226	.00567	.00565	25,004	141	.00564	.00562
37	33,016	226	.00685	.00683	21,593	128	.00593	.00591
42	28,848	231	.00801	.00798	18,047	116	.00643	.00641
47	24,348	244	.01002	.00997	15,110	121	.00801	.00798
52	20,179	260	.01288	.01280	11,784	124	.01052	.01046
57	12,591	236	.01874	.01857	7,609	119	.01564	.01552
62	9,891	235	.02376	.02348	5,705	117	.02051	.02030
67	5,801	211	.03637	.03572	4,245	137	.03227	.03176
72	3,593	210	.05845	.05679	2,658	129	.04853	.04738
77	2,014	175	.08689	.08327	1,543	123	.07971	.07665
82	842	118	.14014	.13096	661	78	.11800	.11143
87	277	53	.19134	.17463	247	40	.16194	.14981
92	59	13	.22034	.19847	57	14	.24561	.21875

NOTE. Mx is the central death-rate, when multiplied by 1,000 it gives what is commonly called the mean annual death-rate per 1,000.

Qx is the probability of dying in a certain year of life.

of life of males in the State of Washington from ages 12 and upward is compared with that of other known healthy countries or states, such as Michigan, Indiana, Australia, Denmark, Norway and rural England. The table brings out the exceedingly interesting fact that the differences between these seven countries or states are relatively slight. It will be observed that the expectation of life for males, ages 12 to 22 in the rural districts of England and in Norway at ages 32 to 72 is even higher than for the State of Washington, but no charge of material inaccuracy is likely to be brought against the registration returns of the two countries referred to.

On account of the want of trustworthy statistics of births the functions for the first years of life have not been computed, these being of minor importance; but from the death-rate alone it is possible to roughly estimate the expectation of life at birth, which for males is 56 years and not 70.3 as claimed by Professor Willcox for both sexes combined. This expectation is exceeded not only by the white females of the original registration states, whose expectation of life at birth is 57.35 years, and which Professor Willcox claims to be the highest on record, but also by the females in Norway, 57.70; by Denmark, 57.90; by Sweden, 57.0; by Australia, 58.84; by Tas-

TABLE II.

LIFE TABLE FOR MALES IN THE STATE OF WASHINGTON; BASED ON THE CENSUS OF 1910 AND THE REPORTED DEATHS, 1909, 1910 AND 1911.

Age	qx	log. px	log. 5px	1x	N^1x_5	N^1x	Ex
12	.00251	−.00109	−.00672	100,000	495,753	5,277,930	53.28
17	.00412	−.00179	−.00972	98,465	485,943	4,782,177	49.07
22	.00485	−.00211	−.01062	96,285	474,488	4,296,234	45.12
27	.00492	−.00214	−.01118	93,959	462,722	3,821,746	41.17
32	.00565	−.00246	−.01338	91,571	449,679	3,359,024	37.18
37	.00683	−.00298	−.01583	88,793	434,708	2,909,345	33.27
42	.00798	−.00348	−.01809	85,615	417,328	2,474,637	29.40
47	.00997	−.00435	−.02389	81,952	397,000	2,057,309	25.60
52	.01280	−.00559	−.03287	77,566	371,391	1,660,309	21.91
57	.01857	−.00814	−.04448	71,912	339,130	1,288,916	18.42
62	.02348	−.01032	−.06108	64,911	299,861	949,788	15.13
67	.03572	−.01580	−.09681	56,395	249,091	649,927	12.02
72	.05679	−.02539	−.14937	45,126	186,636	400,836	9.32
77	.08327	−.03776	−.23320	31,995	119,541	214,200	7.20
82	.13096	−.06096	−.35167	18,701	60,767	94,659	5.56
87	.17463	−.08335	−.44047	8,321	24,039	33,892	4.57
92	.19847	−.09608	−.51614	3,018	7,893	9,853	3.76
97	.25385	−.12717	−.84762	920	1,839	1,960	2.63
102	.46560	−.27213	−2.04746	131	120	121	1.42
107	....	....	....	1	1	1	....

NOTE. qx is the probability of dying in a year, px the probability of living a year, and 5px the probability of living five years.

1x is the number surviving to exact age x. N^1x_5 is the sum of five values of 1 from x+1 to x+5; N^1x is the sum of the column of 1x from age x+1 to the oldest age. Ex is given in years, and is the complete expectation of life, the average future lifetime of persons aged exactly x.

TABLE III.

EXPECTATION OF LIFE FOR MALES IN THE STATE OF WASHINGTON COMPARED TO OTHER STATES AND FOREIGN COUNTRIES.

Age	Washington 1909–11	Michigan 1909–11	Indiana 1909–11	Australia 1901–10	Denmark 1906–10	Norway 1901–10	England Rural Districts 1911–12
12	53.28	52.34	52.38	51.72	53.2	51.24	54.16
17	49.07	48.01	48.10	47.28	48.8	47.12	49.68
22	45.12	44.03	44.25	43.07	44.6	43.99	45.37
27	41.17	40.14	40.53	38.96	40.5	40.90	41.15
32	37.16	36.16	36.79	34.90	36.4	37.43	36.97
37	33.27	32.19	32.97	30.90	32.2	33.74	32.82
42	29.40	28.20	29.11	27.03	28.2	29.97	28.72
47	25.60	24.34	25.22	23.32	24.4	26.19	24.73
52	21.91	20.61	21.43	19.75	20.7	22.48	20.86
57	18.42	17.01	17.78	16.31	17.2	18.90	17.19
62	15.13	13.71	14.34	13.09	13.9	15.43	13.82
67	12.02	10.77	11.23	10.19	10.9	12.28	10.76
72	9.32	8.20	8.58	7.77	8.3	9.48	8.13
77	7.20	6.12	6.39	5.89	6.1	7.07	6.03
82	5.56	4.53	4.66	4.40	4.3	5.13	4.43
87	4.57	3.48	3.56	3.22	3.0	3.72	3.23
92	3.76	2.66	2.62	2.31	....	2.71	2.39
97	2.63	2.06	1.74	1.63	....	1.98	1.92

TABLE IV.

PROBABILITY OF DYING IN A YEAR FOR MALES IN THE STATE OF WASHINGTON COMPARED TO OTHER STATES AND FOREIGN COUNTRIES.

Age	Washington 1909–11	Michigan 1909–11	Indiana 1909–11	Australia 1901–10	Denmark 1906–10	Norway 1901–10	England rural dists. 1911–12	M. A. (x) 1885–1912
12	2.51	2.38	2.32	1.84	1.77	2.84	1.60	....
17	4.13	3.47	3.80	3.03	3.03	6.33	2.56	....
22	4.86	5.40	5.76	4.04	4.20	9.38	3.43	4.6
27	4.93	5.22	5.44	4.78	4.15	8.21	3.90	4.8
32	5.67	5.63	6.30	5.58	4.78	7.35	4.56	4.9
37	6.85	6.51	6.88	6.98	5.77	7.47	5.34	5.3
42	8.01	7.37	8.09	9.10	7.84	8.12	6.85	6.2
47	10.02	10.50	10.29	12.04	10.15	9.64	8.74	8.5
52	12.88	12.80	11.81	15.38	13.57	12.29	12.01	12.5
57	18.74	18.74	19.41	20.71	19.78	15.71	17.59	18.5
62	23.76	28.00	26.28	30.12	27.46	22.40	26.71	29.1
67	36.37	42.31	40.59	46.44	40.44	33.85	40.18	47.1
72	58.45	65.89	63.41	74.15	62.37	50.71	66.15	72.3
77	86.89	102.41	104.37	111.58	99.60	80.48	103.76	107.9

(x) Life Table of the Medico-Actuarial Committee; in the above table the first four policy years are excluded, that is, the years where medical selection is felt the strongest.

NOTE. The above table gives 1,000qx or rates per 1,000, these being more easily compared than the small values of qx.

TABLE V.

PROBABILITY OF DYING IN A YEAR FOR FEMALES IN THE STATE OF WASHINGTON COMPARED TO OTHER STATES AND FOREIGN COUNTRIES.

Age	Washington 1909–11	Michigan 1909–11	Indiana 1909–11	Australia 1901–10	Denmark 1906–10	Norway 1901–10	England rural districts 1911–12
12	2.49	2.05	2.19	1.75	2.21	3.53	1.73
17	3.52	3.40	4.05	2.69	3.36	5.35	2.69
22	4.87	5.41	5.93	3.70	4.00	6.44	3.29
27	5.13	5.45	6.34	4.69	4.69	6.75	3.74
32	5.62	5.95	6.67	5.58	5.10	7.14	4.45
37	5.91	6.89	7.03	6.59	5.70	7.53	5.11
42	6.41	6.99	7.76	7.57	6.69	7.88	5.87
47	7.98	9.20	9.16	8.51	7.73	8.42	7.31
52	10.46	12.06	12.20	10.54	10.23	10.32	10.37
57	15.52	16.86	16.58	14.76	13.45	13.33	15.33
62	20.30	24.16	24.63	22.97	21.02	18.78	22.01
67	31.76	36.97	37.80	35.77	34.32	28.57	33.40
72	47.38	61.50	62.84	58.87	54.83	44.88	56.58
77	76.65	94.10	91.93	91.01	89.67	73.69	89.54

mania, 59.29; by New Zealand, 61.76; also by the males separately in Tasmania, 57.76; and by New Zealand males, 59.17.

"A more useful comparison is made in Tables IV and V, showing the probability of dying in a year. These tables indicate that the mortality

curve for the State of Washington is by no means the lowest on record and show a pronounced similarity to the male and female mortality curves for the States of Michigan and Indiana. The rates are even lower for the males of Denmark, ages 12 to 42, and for the females of Denmark, ages 12 to 37, for the males of Norway, ages 52 and upward, and the females of Norway, ages 47 and upward, and finally for the rural districts of England for males as well as females, ages 12 to 57 inclusive.

"These general observations would therefore seem to justify the conclusion that in their general aspects the mortality data for the State of Washington do not justify the charge of obviously incomplete registration and that the mortality rates are in all probability as trustworthy as those for other registration states when the local facts of population distribution, with all that that implies as to age, race, nativity, occupation, etc., are taken into account. Furthermore, it is entirely safe to assert that there is a definite and measurable relation between what is generally called the local climate or weather conditions, etc., and the actual health and longevity of the inhabitants, and there can be no question of doubt but that these conditions in the State of Washington are more advantageous than in many other sections of the United States and abroad. It requires also to be kept in mind that in a new state the heavy immigration consisting chiefly of healthy and strong individuals from other sections has an effect somewhat similar to medical selection in life insurance. Just as cripples, weaklings or consumptives do not emigrate to new lands to do pioneer work or engage in lumbering, mining, etc., so the rejection rate in life insurance eliminates those predisposed to early death from the risks accepted and insured at normal rates. All the investigations which have been made into the influence of medical selection on life insurance experience prove that the mortality rate is quite considerably reduced, at least during the first five years of insurance. According to the Medico-Actuarial Investigation the mortality rates per thousand during the first policy year when compared with the fifth or later years of duration at specimen ages have been as follows:

Ages	First policy year	Fifth or later policy year	Ratio 1st to 5th or later year
22	3.3	4.6	72
32	3.7	4.9	76
42	4.7	6.2	76
55	12.2	15.8	77

At age 32, for illustration, the death-rate was 3.7 per thousand during the first year of insurance against 4.9 per thousand during the fifth or subsequent years; in other words, the rate during the first year was only 76 per cent of the rate during the later years. The same conclusion applies to the mortality rate of a new area or state where the conditions of life have not attained to maturity or where they are not as yet thoroughly representative of the conditions common to normal and long-settled populations."

I regret that I am not personally acquainted with Professor Willcox, but I presume he is really earnest in his statements and is willing to make some sacrifice to prove them correct, which he undoubtedly feels he is able to do. Therefore, I have the honor to submit the following propositions:

1st. If Professor Willcox will come to Washington and make an actual study of conditions and will show that we are not getting more than 95 per cent of the deaths that occur in this state, I will pay all expenses incurred by him in such work.

2d. If it were not inappropriate to make such a suggestion I would be entirely willing to pay a penalty of $5 for every death in excess of 50 ascertained to have been unrecorded during the previous calendar year by Professor Willcox or any one delegated by him for the purpose, the money to go to the National Red Cross.

DISCUSSION.

MR. KNUD STOUMANN: "Theory *versus* Practice in Vital Statistics" is a case it should be unnecessary to bring to judgment and that can arise only through mistakes or lack of mutual understanding, and the title of this paper may, therefore, not be quite appropriate. If the word "and" had been substituted for "versus" the problem would have suggested for discussion a subject that, although fundamental, has received scant attention from the workers of statistics.

Theory and practice should go hand in hand; they are, in fact, only different perspectives of the same subject. If a discrepancy should appear between the two, one of them, at least, must be at fault. If the practical gatherer of statistical data disregards the rules laid down in the theory of statistics his data are apt to become worthless and his conclusions will be void. If, on the other hand, the student of statistical theory arrives at conclusions that are at variance with the facts, his hypotheses have been erroneous or his reasoning has been illogical.

The late Professor T. N. Thiele, the eminent Danish authority on life tables and the theory of probabilities, and at the same time an astronomer of high merit and a practical actuary, says very appropriately in his book "Theory of Observations":

"It will be found that every applied science, which is well developed, may be divided into two parts, a theoretical (speculative or mathematical) part and an empirical (observational) one. Both are absolutely necessary and the growth of science depends very much on their influencing one another and advancing simultaneously. No lasting divergence or subordination of one to the other can be allowed."

If you health officers and registrars of vital statistics find that your orbservations, duly certified to be correct and complete, do not conform to our theory, it is your privilege to reject, if necessary, the hypotheses of the theory, and demand the theorist to revise his work. Years ago an old farmer in the parliament of Denmark when pressed hard by adverse facts piled up against him routed his opponents by exclaiming: "But I deny facts!" This may be final in politics but hardly permissible in science.

This has a direct bearing upon the question that brought Doctor Tuttle here from Seattle. The completeness of the death registration in the State of Washington for which he is responsible has been attacked from a theoretical standpoint, and he is here to defend his honor as health administrator. I understand that actual investigation conducted by the Federal Census Office has proved the registration of deaths in the State of Washington to be as complete as in the Eastern States. We can, therefore, without further discussion reject the hypotheses on which the attack was based. But a hard feeling may remain, and the incidence constitutes a warning to the students of theory to be more careful in the selection of their hypotheses and to pass judgment only after the most thorough analysis.

A perusal of the article in question shows the main hypothesis, in abridged form, to be that: "Under present American conditions and in a normally constituted but increasing population a death-rate of below 14 may be viewed with serious question; a death-rate of below 12 is

presumably incorrect, and a death-rate of below 10 deserves no serious statistical analysis."

No proof or justification is given of this statement and we may, accordingly, consider it a hypothesis. As such it is a failure, if only because its application is restricted to American conditions; the statement is known to be at variance with the conditions in Denmark, Norway, Sweden, Holland, Australia, New Zealand and several minor localities, and consequently it cannot be accepted without further comment as valid for America. Hypotheses should always be of a general character and limited in number.

Furthermore, no crude death-rate should be employed to decide important issues as it is a too composite figure, influenced by every peculiarity of the population composition as race, sex, age, occupation, etc. When analyzing statistical data all influences but the one to be compared for should first be eliminated; if this is impossible we can draw no safe conclusions, and the only honorable course is to admit that. Standardization of death-rates for sex and age constitution is very simple and is no new invention; it was practiced as early as 1853 in the British Army Statistical Report. But in a thorough analysis we cannot consider this sufficient; the compound death-rate for all ages will, even when standardized obscure the peculiarities of the mortality curve at the different periods of life. We are entitled to regard our work as finished only when the life tables for each sex and race, or the specific death-rates for sufficiently short period of life, are computed, and when the causes of death and the regional and occupational influences are minutely exposed. Our minds should be blank when we commence the statistical analysis, and sensationalism must be shunned; hasty conclusions are a thousand times worse than none. The famous Belgian statistician and astronomer Quetelet wrote about 1837: "In fact many persons only recur to statistics with a view to give consistency to preconceived ideas: they wrap up their ideas in a scientific veil in the hope of rendering them imposing."

The registrars of statistics and the builders of the theory should be equally true to the science they persue, and know that they are equally indispensable. The possibilities of statistics as a helper to all other sciences are only beginning to be realized, and posterity will count you among the most useful servants and promoters of mankind.

Remember that every faulty or hasty statement is a step backward and injures the entire profession, and always bear in mind that theory and practice can do their duty only by working in close harmony.

A COMMUNICATION FROM PROFESSOR WILLCOX.

The foregoing paper needs no extended reply. Whoever is interested in the issues about which Doctor Tuttle and I differ has accessible in this article and its predecessors the material for forming his own opinion about them. It may be worth while, however, briefly to recount my previous experiences in this field and to restate my main points.

Years ago, when the death-rate of Ithaca seemed incredibly low, I found on investigation that nearly one third of the deaths went unregistered in disregard of the law, but it took many months with the help of several students to establish the facts. Some years later I challenged the death-rate of Buffalo, which then claimed to be the healthiest city in the world, because it had the lowest death-rate. I obtained opinions from Mr. Hoffman, who was disposed to accept the Buffalo figures, and from Doctor Billings, who rejected them. Evidence from the census of 1900 proved, some years later, that my contention about that city had been correct. A third challenge of the same sort was made about the infant mortality of England and Wales.* This elicited no reply from the author whom I criticized, but brought from the first English authority in vital statistics a

* *The Nation*, Vol. lxxxv, p. 227 (September 12, 1907).

private letter accepting my conclusions. With these confirmations and no refutations of similar opinions expressed in the past, I am content in this case to await the verdict of the judicious.

My main points briefly are these:

1. To develop a system of recording deaths with substantial completeness requires not merely a good registration law, but also years of energetic and tactful administration.

2. The obstacles to the development of such a system in newly settled states and in sparsely settled districts are especially great.

3. The published death-rates of several American states and of many rural counties are so low as to warrant their rejection as untrustworthy.

4. When the correctness of these rates is tested by studying their local variations of the infant mortality or the ratio of deaths from preventable disease to all deaths or the conclusion from applying the rates to any standard population, the results are such as to strengthen rather than weaken one's disbelief in them.

5. These general conclusions apply to the state of Washington and especially to its rural counties with greater force than to any other state and justify a skeptical attitude towards its published death-rates.

6. It is the duty of a statist to form an opinion about the probable error of any figures he uses and to lay that opinion, with the reasons for it, before his readers.

WALTER F. WILLCOX.

BLEACHING POWDER IN PLACE OF PERMANGANATE IN FUMIGATION.

DAVID WILBUR HORN, PH. D.

Abstracted from a paper read before Section C, American Association Advancement of Science, Dec. 28, 1917.

THE action of bleaching powder upon formalin is a good and cheap way to fumigate rooms. Since originated by the writer in 1915 it has been used without any objection in fumigating upward of 2,200 rooms.

The various methods heretofore used are not equally efficient. The permanganate-formalin method in the ratio of 1 part by weight of permanganate to 2 parts by volume of formalin yields as gas about 37.5 per cent of the total weight of formaldehyde actually dissolved in the formalin used; and 250 grams of permanganate with 500 cc. of formalin yield about 75 grams of formaldehyde gas; these are the amounts usually recommended for 1,000 cubic feet.

In order to get this same weight of formaldehyde gas (*i. e.*, 75 grams) about three times as much of sodium dichromate, sulphuric acid, glycerine and formalin, as recommended for 1,000 cubic feet by the Pennsylvania Department of Health, must be used.

In order to get this same weight of formaldehyde gas, (*i. e.*, 75 grams) one should use for 1,000 cubic feet the following:

Bleaching powder, 620 grams, or one and one-third pounds.

Formalin, 800 cc., or one and seven-tenths pints.

At current prices (December 24, 1917) the costs of fumigating 1,000 cubic feet by the three methods are:

Permanganate-formalin, $2.29.

Dichromate-formalin, 1.14.

Bleach-formalin, .39.

The statements of Hamilton in a paper from the Research Department of Parke Davis & Company in the March number of this JOURNAL, page 283, under the title "Facts and Fallacies in Disinfection," are utterly misleading if applied to fumigations using bleach and formalin. Hamilton himself was misled by his fallacious assumption that Frankforter & West's method for determining evolved formaldehyde was applicable to the assay of fumigation-mixtures.

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A NATIONAL PUBLIC HEALTH DEPARTMENT IN ENGLAND.

To readers of the JOURNAL no recent occurrence has created more interest than the report that a petition had arisen within the United States Public Health Service, which has grown out of the Marine Hospital Service, almost as old as the Union itself, to have the Service absorbed either into the national army or into the navy of the United States. A later report has it that the amalgamation would probably not be completed. While an intense patriotism is implied when so well equipped a civil organization should wish to be placed where its splendid personnel could engage in the more active and congenial labors of a fighting arm of the service; yet that this action becomes of especial moment, viewed from the standpoint of those who have been looking for great developments of the internal public health services of the country and continent, need not be questioned.

The action thus taken is of further interest in view of the growing agitation in England where, with the two traditional services of the army and navy just now of such supreme importance, medical men and those associated in sanitary and social work are demanding that in the interests of efficiency, economy and scientific development, the government should establish at once a Ministry of Health under which would be coördinated much public health work at present being carried on by different departments of the Public Service. Press reports from England seem somewhat contradictory, as where the Daily *Express* of London recently published a long article to the effect that Dr. Addison, Minister

of Reconstruction, had been offered and accepted the post of Minister of Public Health. This statement, however, was refuted by an official announcement "that his only personal concern with the question of the establishment of the Ministry of Health has been that as Minister of Reconstruction he is giving assistance in arriving at an agreed scheme for the establishment of a Ministry."

How rapidly the evolution of medical and public sentiment in this direction has gone in England since the Health Insurance Act of 1911, then so bitterly opposed, had proved of such great benefit not only to the public but to the medical profession is seen in the following résumé of the report of a Committee of the British Medical Association:

"The degree of unanimity so far disclosed is somewhat remarkable and suggests that the scheme which is proving a distinct gain to the medical profession as well as to the public be still further extended to the dependents of insured persons, and for providing, when necessary, specialists and nursing services, institutional treatment, maternity attendance etc., beyond what can be provided by the general medical practitioner."

To illustrate further the sentiment of those professionally engaged in public health work the following summary of a petition forwarded to the Local Government Board by the officers of the two chief Public Health Societies in England representing 1,100 medical officers may be given:

A Memorandum Re Ministry of Health.

Your memorialists submit that:

1. The present wasteful and inefficient system by which the responsibility for the nation's health is divided up centrally among so many departments is to be deplored.

2. That the unification and control of all machinery for such work, both central and local, which is for the maintenance of health and the provision of treatment for the people is essential.

3. That the establishment of a Ministry of Health with a Central Health Department is essential to this end and that it should include provision for and control of,

(a) Sanatoria and treatment of tuberculosis.
(b) Provision of isolation hospitals and control of contagious diseases.
(c) Prevention and cure of venereal diseases.
(d) Administration of the Vaccination Acts.
(e) School hygiene and inspection of children.
(f) Supervision of state provided medical services and state-supported institutions.
(g) Maternity and child welfare work.
(h) Medical research and provision of laboratories.
(i) Control of public water supplies, gathering grounds, etc.
(j) Housing and town planning.
(k) Sewerage, drainage and abatement of nuisances, etc.
(l) Ship sanitation and hygiene.
(m) Sanitary control of emigrants and immigrants.
(n) Railway hygiene.
(o) Milk supply and food inspection.
(p) Factory and workshop inspection, hours of work, factory welfare work.
(q) Compilation of vital statistics.
(r) Public health legislation.

P. H. B.

A WELCOME TO WOMEN IN PUBLIC HEALTH WORK.

With the call to the colors of medical men, sanitarians, and health officers, great gaps have been made in the ranks of defenders of the health of the civilian population. This is even more notable in public health circles than elsewhere because, public health science being comparatively young, its practitioners are largely within the draft age.

The suggestion naturally arises: why should not young women already trained or available for training be used to fill many of these positions? The supply of women physicians really qualified to undertake public health work is probably small, but some of those recently graduated ought to be fairly well prepared and others might soon prepare themselves by short courses in one of the several schools now available for those lacking public health training. Moreover, there must be in the medical schools a good many young women who, without stopping at present to finish their courses for the degree of Doctor of Medicine, might interrupt their medical training to take that brief but indispensable technical training, which would fit them for public health positions.

Recently, the Chairman of the Harvard-Technology School for Health Officers, discovering from his own observation and from the applications which he has been receiving and unable to fill for health officers, laboratorians, industrial health inspectors, municipal filter operators and the like, the great scarcity of trained public health workers, has visited the larger women's colleges in Massachusetts, making addresses on the need and opportunity for women in all sorts of technical pursuits, and appealing particularly to those seniors having medical or semi-medical tastes to prepare themselves in chemistry, physics, and biology as thoroughly as possible before graduating in June next, and then to take during the summer intensive work in public health subjects which will fit them for professional positions in laboratories, inspectorships, and the like, possibly by the first of next October.

This movement is not confined to the East, for Prof. W. H. Frost, of the University of Wisconsin states that a considerable number of his women students in laboratory courses are finding employment in public health laboratories, where they are said to give very efficient service.

We are glad to commend this undertaking, and we greatly hope that many young women of ability, education, and taste for public health work, may within a few months turn their faces toward public health schools and prepare themselves as thoroughly as possible for the numerous public health positions already open, as well as for the much larger number likely to fall vacant in the near future.

There is altogether too much tendency on the part of young men and young women to rush into army or navy service of one kind or another, to the neglect of the welfare of the civilian population upon which, after all, the war must depend for supplies and resources. General Gorgas was entirely right in emphasizing in one of his addresses before the American Public Health Association in October the fact that the physical and sanitary welfare of the Army and Navy is no more important than that of the civilian population upon which it depends; and the entrance of duly qualified and well trained young women into the ranks of public health workers will, we are sure, be welcomed by all who have the interests of the whole American people at heart.

W. T. S.

YOUR ANNUAL HEALTH REPORT.

This is the season of the annual health report. A few of the 1916 reports are still straggling in, but the wise health officer realizes that a prompt report is a sign of efficiency and that a stale report loses much of its force.

It is well to ask at the outset: Just what is the purpose of the health report? What is it to accomplish? To whom is it addressed, the Mayor, the Council, the doctors, the civic clubs, or just to the common people? Unless the health officer has the answer to these questions clearly in mind when writing his report, his document is not likely to be very useful.

While the typic reader and the purpose must necessarily vary with different reports, nearly every report should accomplish the following things:

1. It should justify the expense of the health department by giving a clear account of the activities during the year.
2. It should give an intelligible account of the money spent during the year.
3. It should state the health problems of the community, and present a program for solving them in so far as is possible.
4. It should give such statistical information as may be of value to the reader for whom the report is intended.

The account of the year's work is usually given in a satisfactory manner. However, very many reports sin in not giving a good statement of expense; yet no page is more interesting to the legislator who appropriates, the tax-payer who foots the bill and, in general, to the man who is interested in efficient health administration. A mere statement of disbursements for salaries, stationery, etc., is not sufficient: the classification should be according to functions. Then it is possible to determine whether a department is using its funds for activities that count, such as communicable disease control, infant welfare, health education, etc., or for work that has little or no public health significance, such as garbage collection or nuisance inspection. It is hoped that this year an increasing number of health reports will follow the scheme of statement outlined by Powers.* Then the health officer will be able to compare his expenditures with those of other cities.

Throughout the report, the writer should keep in mind the purpose of his report, and the reader whom he is addressing. Unless the report is intended for the professional sanitarian, the statistics should be selected and explained with great care. Probably most city reports waste valuable space upon tables which had better be left for the reports of the state or of the United States Census Bureau. A report which gives the local health problems in plain English, illustrated by a few significant figures or charts, will be far more useful in obtaining the desired appropriation than highly detailed statistical tables. Useless matter always detracts from the real message.

If statistics be given, let them be accurate. A report comes to mind which consistently referred to a birth-rate of *20 per cent.* Such a rate would be applicable to a community of guinea-pigs, but not to human beings. The use of statistics† is a science, and the careless user will surely come to grief.

Veiller has said: "A last year's bird-nest is of enormous utility compared with a lying reformer"—and a statistical liar is no better than the ordinary garden variety. Therefore the greatest care is necessary in quoting statistics, and in

* G. L. Powers: "Uniform Accounts in Health Administration." U. S. Census Bureau, 1912.

† See J. W. Trask: "Vital Statistics and their Uses." Bulletin of the U. S. Public Health Service. Also "Report of Committee on Uniform Health Reports," AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. 3, No. 6 (June, 1913). Unfortunately, single copies of this issue are no longer available.

drawing conclusions from them; otherwise the statistics will act as a boomerang, and injure both the statistician and his cause.

Among the smaller cities which had attractive reports last year were Montclair and East Orange in New Jersey, and Palo Alto, Cal. The reports of Jacksonville, Fla., Richmond, Va., and of New York City also deserve study. In sending for reports, it is highly commendable to enclose postage.

A. W. H.

THE COMING FOOD NUMBER OF THE JOURNAL.

One of the gratifying features of the Washington meetings was the enthusiasm displayed at the sessions of the Food and Drugs Section. The meetings were well attended, and the papers were well chosen. One of the obligations of the health official at this time is to assist in the spread of the gospel of food conservation. It is, therefore, fortunate that we shall be able in the March issue of this JOURNAL to present a number devoted largely to the problems related to the food supply.

Association News.

By the Secretary, A. W. Hedrich.

Payment of Association Dues by Employers.—Many of our members feel that inasmuch as the services of the Association are a necessary part of their working equipment, the charge therefor should be paid by the employer, whether a health department or a private corporation. When requested, therefore, we are glad to address bills as follows:

Department of Health, Smithville, Mass.
Attention of Dr. A. R. Jones.

Doctor Jones will then be registered in our files and printed membership lists as the representative of the Smithville Health Department, entitled to all of the membership privileges. For simplicity in mailing, the bill and Journal must be addressed in the same way.

Members who wish to have their stencils changed in this manner are requested to notify us at once, so that the new bills may be properly addressed when due.

Membership Certificates.—The Secretary has received a supply of membership certificates, neatly printed in two colors. One newly elected member writes: "Mine was spoiled by rain; please send another. I want to frame it."

Membership in the Association is a sign of progress. Why not send the Secretary three cents in postage and have a framed certificate in *your* office?

Note.—Help Wanted Announcements are published here free of charge.—Editor.

Help Wanted.—

Health Officer for New Jersey City. Salary: $1800. Address B. D. T., No. 99, care of this Journal.

A local health officer for Massachusetts city of 40,000 population. M. D. required. Salary: $2,000 with increase. Address S. A. H., No. 98, care of this Journal.

Chief operator in charge of water filtration plant wanted in a southern state. Salary: $2,100 per year. Address S. C., No. 99, care this Journal.

First-class sanitary engineer who can handle laboratory end of water examinations wanted by a Nebraska health department. Salary: $2,000. Address W. F. W., No. 101, care this Journal.

Two physicians wanted in a southern state to take charge of rural sanitation work in two counties. Salary: $2,000 and traveling expenses. Also four public health nurses are desired for visiting homes, inspection of schools, giving instruction where there is tuberculosis. Address R. A. L., No. 100, care of this Journal.

Chief health officer and director of laboratory wanted in New Brunswick Province, Canada. The latter should have knowledge of clinical bacteriology, pathology, serology and possibly medico legal work. Both men under forty-five years of age. Salary to suit applicant if eligible. Address R. F. W., No. 97, care this Journal.

Man wanted to take charge of water filter operation of southern city and military camp. Salary: $1,800 to $2,000. Address S. W. C., No. 96, care this Journal.

Experiences with the New Standard Methods of Water Analysis.—An article by H. E. Hasseltine in the *Public Health Reports*, November 9, 1917, criticises certain of the methods given in the third Report (1917), of the Committee on Standard Methods for the Examination of Water and Sewage. His criticisms are as follows:

The Standard Methods require that all media shall be sterilized in the autoclave at 15 pounds (120° C. for 15 minutes after the pressure reaches 15 pounds). Comparative tests of water samples with lactose broth sterilized in this way and lactose broth heated after the addition of the carbohydrate to 100° C. for 30 minutes showed a much higher incidence of gas formation with the former. This results in a false increase in positive presumptive tests and increases the number of tubes to be plated when confirmatory tests are to be carried out. In lactose broth sterilized at 15 pounds pressure, *B. proteus* was found to produce gas and would conform therefore to the requirements given in the Standard Methods. Based on the results of confirmatory tests Hasseltine believes that the formation of less than 10 per cent of gas should be disregarded. The Standard Methods classify as a member of the

B. coli group any non-sporing bacillus which fished from Endo shows gas formation in forty-eight hours. On comparative tests the Endo medium recommended in the Standard Methods was found to give numerous atypical colonies with *B. coli*. The development of atypical colonies is due to the fact that the amount of fuchsin and sulphite is insufficient to give optimum coloration of the *B. coli* colony.

These results were presented by Hasseltine at the meeting of the Laboratory Section at Washington. They raised considerable discussion, questioning as they do the basic validity of the bacteriological portion of Standard Methods. The claims will doubtless be investigated by the Committee on Bacteriological Methods, of which Prof. Fred P. Gorham is chairman. The report of this committee and the contributions of other observers should form an important part of the proceedings of the Laboratory Section at the next annual meeting.

✦

Old Journals Wanted.—In order to complete a few files of the AMERICAN JOURNAL OF PUBLIC HEALTH, and of the transactions of the Association, we offer to buy the issues listed below. We are prepared to pay 25 cents per copy for the single issues required, or $1.25 for the complete volume of the year in question:

Transactions of the A. P. H. A. Wanted: Nos. 3, 5, 6, 15, 16, 17, 27, 28, 33, 36, at $1.00 per volume.

American Journal of Public Hygiene. Wanted: Vol. 1-6, at $1.25 per volume.

AMERICAN JOURNAL OF PUBLIC HEALTH. Wanted: Vol. I (1911). Issues of April, May, and June, at 25c. Also complete volumes at $1.25.

Vol. III (1913). Issues of January, August and September, at 25c. Also complete volumes at $1.25.

Vol. IV (1914). Issues of September and January at 25c.

If you have any of these to sell, please write at once to the Secretary at 126 Massachusetts Ave., Boston, Mass.

Medical and public health libraries which desire to install a file of this JOURNAL will do well to apply at once for one of the very few sets now on hand. In a very short time these will no longer be obtainable.

The following have been elected to membership in the American Public Health Association:

Amy Morris Homans, Wellesley College, Mass., Professor of Hygiene.

Pansy V. Besom, R. N., 16 Moore St., Winthrop Beach, Mass.

James S. Mitchener, M. D., Kingston, N. C., County Health Officer.

Paul M. Holmes, M. D., 22 Norwood Court, Toledo, Ohio, Physician.

Bernard J. Newman, 7734 Norwood Avenue, Philadelphia, Director Pennsylvania School for Social Service.

Charles D. Mare, Stanford University, Cal., Engineer and Professor of Civil Engineering.

J. Treichler Butz, M. D., Allentown, Pa.

Irving M. Cashell, Goldsboro, N. C., Veterinarian, Health Officer and Bacteriologist.

Robert D. Hamilton, M. D., Newburyport, Mass., Physician.

H. E. Hitchcock, M. D., Houlton, Me., district Health Officer.

Thomas G. Hull, Washington, D. C., U. S. Food Administration.

J. A. Hunter, Pittsburgh, Pa., Steam and Sanitary Engineer.

Kenneth M. Lynch, Charleston, S. C., Professor of Pathology and Research Medicine.

Frank C. Mantel, Memphis, Tenn., City Chemist and Bacteriologist.

Frank I. Mayer, Newark, Ohio, Bacteriologist.

Annetta J. Nicoll, Topeka, Kan., City Bacteriologist and Food Inspector.

Paul S. Nice, Denver, Col., Bacteriologist.

Raymond O'Donnell, State College, Pa., Professor in Civil Engineering Department.

Andrew G. Sandblad, McKeesport, Pa., Physician.

John W. Tapper, Lynn, Mass., Chairman, Board of Health.

R. P. Albaugh, M. D., Columbus, Ohio, Director, Division of Industrial Hygiene.

F. C. Wells, M. D., New York City, Medical Director Equitable Life Assurance Society.

Harrison Hale, Springfield, Mo.

W. C. Dumas, Atlanta, Ga., Chemist.

Miss Lula M. Preston, Statesville, N. C., Nurse.

C. L. Rice, Lowell, Mass., Sanitary Engineer.

Henry J. Ramsey, Washington, D. C., Pomologist.

Dr. Everitt A. Wimson, Perth, Australia, Health Official.

Professor Warren C. Taylor, Schenectady, N. Y.

J. K. Gore, Newark, N. J., Vice-President and Actuary, Prudential Insurance Company.

Lydia A. DeVilbiss, M. D., Topeka, Kan., Director Division Child Hygiene.

R. E. Lee, Meadville, Pa.

Drs. C. A. Bower, A. S. Jackson, and C. E. McCauley, members South Dakota State Health Board.

✱

The New Health Commissioner of New York City.—J. Lewis Amster, M. D. was born in New York City in 1879 and attended public schools and the College of the City of New York. He is well known to his colleagues for his interest in all matters relating to the medical profession. He is active in the affairs of the Bronx County Medical Society of which he was at one time vice-president and is now president. In the latter capacity Doctor Amster has taken an active part in promoting coöperation between the physicians of the Bronx and the Department of Health.

He is Associate Surgeon, Lincoln Hospital, Bronx. In addition to this Assistant Visiting Surgeon, Penitentiary and Workhouse Hospital; Instructor in Surgery, Polyclinic; Consulting Surgeon, Home for Aged and Little Sisters of the Poor; Member of the American Medical Association and of the Clinical Congress of Surgeons of North America.

In a recent statement, Doctor Amster said:

"The work of the Department of Health is perhaps the most important activity carried on by the municipality. The present organization has been built up as the result of years of labor.

"I realize that the duties of this important office are tremendous and I am satisfied responsibilities can be made lighter, if coöperative measures are immediately established between the Department of Health and the physicians of this city. Only with such coöperation and mutual understanding can the efficiency of the Health Department be maintained."

✱

We have just learned that Prof. Otto Rahn, formerly of Urbana, Ill., has been detained in Germany. He returned to Germany in July, 1914, to visit his parents and was caught by the war. The latest news from him indicated that he was drafted into the German army as a chemist with the Aeroplane Service on the Russian front.

Miss Gertrude Seymour, Health Editor of *The Survey*, is on leave of absence and will, during the immediate future, be employed with the Council of National Defense, Medical Section.

Dr. E. S. Tenney, until recently State Health Commissioner of Nebraska, has resigned and is now a Major in the Medical Reserve Corps. He is at present an instructor in military hygiene and sanitation at the M. O. T. C., Fort Riley, Kan.

Dr. Haven Emerson, until recently Health Commissioner of New York City, has departed for France as a Major in the Medical Reserve Corps.

Dr. Andrew Jackson Warren of Hillsboro has been appointed Health Officer by the State Board of Health of Rowan County, N. C., to relieve Dr. L. J. Smith who has been transferred to Wilson County in the Officers' Medical Reserve Corps.

Mr. A. R. Murphy of Wallace & Tiernan Company of New York City is associated with the army Engineering Corps, Water Supplies Division, and expects to be in France in the near future.

Francis E. Daniels, Assistant Engineer with the Pennsylvania State Department of Health, has accepted a commission as Captain in the Sanitary Corps of the National Army. He has been assigned for duty to Camp Greene, Charlotte, N. C.

Mr. H. G. Parker, formerly Bacteriologist of the Department of Health at Norfolk, Va., has enlisted in the army and is now on duty in Washington, D. C.

Assistant Surgeon-General W. C. Rucker of the United States Public Health Service writes that he is in preparation for a European detail.

Dr. Ramon Guiteras of New York City, one of the best known members of this Association, died in New York City December 13, 1917, of meningitis.

Dr. William Levin, First Lieutenant, Sanitary Corps, is located at the Base Hospital, Fort Riley, Kan.

Mr. John O'Neill of New Orleans is now a Captain in the Sanitary Corps, stationed at Camp Sheridan, Ala.

Books and Reports Reviewed.

Impotence, Sterility, and Sex Gland Implantation. *G. Frank Lydston, M. D., D. C. L. The Riverton Press, Chicago, Ill. 1917. 333 pp. (illustrated). Price $4.00.*

This monograph on the diseases and aberrations of the sex function contains a great amount of the original work which Doctor Lydston has already published in the *New York Medical Journal*, the *Journal of Urology*, and other medical journals. The chapters on sterility, sex aberrations, and sterilization, are recommended by the author to the attention of the legal profession. The work deals with hermaphroditism, precocious sexuality, sex perversion and inversion, impotence, sterility, masturbation, spermatorrhea, and sexual neurasthenia, but by far the most valuable chapters in the book are the three dealing with the author's own work as well as other experimental work in sex gland implantation.

Excellent photomicrography is shown in the cuts in these chapters. Doctor Lydston claims to have been the first person to implant an entire human testis for therapeutic or experimental purpose and his was the first successful implantation of human sex glands taken from the dead body. He can justly claim the credit for much original work, and from his researches he concludes that sex gland implantation from living or dead bodies is practicable, that the benefits accrue irrespective of the site of implantation, and that the internal sex gland secretion is stimulant, nutrient, tonic, and re-constructive, and should increase the resistance to disease; and that any chronic disease in which improvement of nutrition is desired such as tuberculosis, anemia, etc., would be benefited by sex gland implantation. He holds also that senility can be retarded and longevity possibly increased by this means. He has used such implantation in the treatment of impotence in the male and in sterility in both sexes and in certain cases of skin diseases. Such diseases as chronic nephritis and diabetes, as well as arterio sclerosis, seem to indicate implantation. The author also makes the general claim that successful "implantation" ought inevitably to increase physiologic efficiency with all the benefits accruing therefrom. The author holds that perversion of the quality or lessening of the quantity of the sex hormone formed in the glands that produce the parental germ cell or sperm cell, or both, is the biologic foundation of both psychic and physical aberrations of sex differentiation, and believes that the abuses of sexual physiology can be combated only upon purely physical grounds. This point of view is not entirely consistently maintained. The tone of parts of the book seems distinctly "gossipy."

D. B. Armstrong, M. D.

Suggestions to Authors and A. M. A. Style Book. *American Medical Assn., 535 N. Dearborn St., Chicago. 68 pp. 1917. Paper, 10 cents.*

First have something to say, then say it briefly and simply in clear, definite language reduced to manuscript form with a short, explicit title, clear, descriptive subheads and a carefully prepared summary and conclusions, are suggestions contained in this 68-page publication recently issued by the American Medical Association. Compliance with the many valuable suggestions contained in this pamphlet would be greatly appreciated by the many editors and hosts of readers who are obliged to wade through volumes of all but useless rubbish in the quest of something really worth while. The book will be useful to public health authors as well as to writers on strictly medical subjects.

The subject matter is divided into three parts. Part I is of special use to authors, and deals with the writing of an article, the preparation of the manuscript, the use of illustrations, tables and charts, and proof-reading by the author. The points are then summed up in short, sentences of which the following are concise examples:

Plan your paper before you write it.

Make your title descriptive but brief.

Write in a simple, careful, grammatical style.

Delete all nonessential words, phrases, sentences and paragraphs.

Send the original, not the carbon copy, to the publisher.

Fold, do not roll, manuscripts.

Illustrations must illustrate.

Provide a legend for each illustration.

Number tables and illustrations, and refer to these by number.

Part II is the style book which gives typographical rules governing uniformity in composition, with suggestions for the editing of copy. These include rules as to spelling, use of the hyphen, words frequently confused, capitalization, style of military terms, numbers, abbreviations and prescriptions.

The last section, part III, deals with bibliographic style in footnotes and references, and gives a list of the full and abbreviated titles of the world's more common periodicals devoted to medicine and allied sciences. As this list includes nearly seven hundred different periodicals, it may be regarded as sufficiently complete for ordinary reference purposes.

Millard Knowlton, M. D.

A Course in Food Analysis. *Andrew L. Winton, Ph. D. New York: John Wiley & Sons, Inc., pp. 252. Price $1.50 net.*

This book, designed for the student, purposes to "start the student upon the right road to . . . become a professional food analyst," and also purposes to substitute food analysis for the usual courses in qualitative and quantitative analyses given to those students who do not propose to make a profession of chemistry. The student is given more instruction with respect to analytical processes and at the same time gains an intimate knowledge of the chemistry of life. Doctor Winton, having been in charge of the laboratory of the Connecticut Agricultural Experiment Station and the Chief of the Chicago laboratory of the United States Department of Agriculture, as well as spending a portion of his life in teaching, is well qualified to prepare such a book. The methods selected cover the analysis of milk and milk products, meat, fish and eggs, cereals, legumes, vegetables, spices, saccharine products, fats and oils, fruits and fruit products, flavoring extracts, and tea, coffee and cocoa. The methods are up-to-date but consist mostly of those not likely to be changed or to become obsolete in the near future. One entire chapter, the longest in the book, is devoted to microscopical examination of foods.

The subject of adulteration is not extensively treated; in fact, it is ignored to a considerable extent, except in those cases where it explains the necessity for the test. For example, the value of the iodine number of fats and oils in detecting adulterants is not mentioned, although the use of cottonseed oil as an adulterant is mentioned under the Halphen test. The author discusses the preservative question "pro and con" in a very satisfactory manner. He states, however, "the use of sulphites in Hamburg steak and sausage is objectionable if for no other reason because it permits the marketing of decomposed meat, serving not merely as a preservative but as a deodorizer."

It is a well known fact that sulphites cannot act as described above. The preservatives best capable of "deodorizing" decomposed meat are spices. The reviewer has found sausages made from rotten meat and so highly spiced that their origin was apparently beyond reproach. On the contrary, he has seen attempts made to deodorize meat with sulphites and the resulting mass when sold was distinctly obnoxious to the senses, even with 1 per cent of sulphite present.

This book is not intended for the practicing food analyst, but it should be carefully studied by teachers who desire to establish courses in food analysis or who are dissatisfied with the text-books they are using and desire to make a change for the better.

Hermann C. Lythgoe.

Food Value of the Banana. *Published by United Fruit Company, Boston.*

This is an advertising booklet of 34 pages, consisting of an article on "The Banana: A Food of Exceptional Value" by Prof. Samuel C. Prescott, and several subsidiary articles upon the same subject, taken from the various published works of well known scientists and health officers.

The article by Professor Prescott was presumably written for this publication, although it has since appeared in the *Scientific Monthly* for January, 1917. It endeavors to point out the high caloric value, easy digestibility, general wholesomeness and relative cheapness of this tropical fruit, and a table compiled from the

figures of Sherman is introduced to show the favorable comparison between bananas and 31 other foods. The only new material claimed by the author is a very complete analysis of the ash of the banana. Bananas contain about 35 per cent refuse. Regarding this the author states, "Since, however, bananas are ordinarily not purchased by weight, but by number, this does not enter into the general question of either cost or food value." In practice bananas are sold wholesale by weight and the retailer adjusts this by charging different prices, according to size of the individual bananas.

The balance of the articles are well chosen and the booklet fills its purpose without making the extravagant, sensational and oftimes erroneous claims found in publications of a similar nature.

Hermann C. Lythgoe.

Communication.

Editor, American Journal of Public Health:

In Dr. E. C. Rosenow's article, "Results of Studies on Epidemic Poliomyelitis," in your December number, certain statements are made which directly bear upon some original work done by me, previously published (*Medical Record*, 1, 13, '17; *J. of Laboratory and Clinical Medicine*, 7, '17), but to which your author does not refer. I, therefore, trust that you will give space to this communication.

Doctor Rosenow states, in reference to the organism of the disease: "Transplants from one to another of these liquid mediums disclose a marked tendency of the microörganism to change to the form characteristic of the medium in which it is planted. . . . '*Frequently, elongated forms resembling diphtheroid bacilli or distinct rods are found in chains which are made up chiefly of typical diplococcus forms.*"

In the articles referred to, I showed how the organism could be grown as a streptococcus-like organism and, at will, developed into a bacillus—apparently of the distemper group—of which the qualities were given in detail. To effect the development from "coccus" to bacillus, a new method, involving the use of serum-bouillon containing *lime-water*, was described. I particularly mentioned that I had secured the same results with two cultures of Doctor Rosenow's isolation, which he had very kindly sent me for comparison. (In the *Medical Record* article he is mentioned by name as the source of two of the cultures employed; and in the article in the *Journal of Laboratory and Clinical Medicine*, his two cultures are referred to as from "a western bacteriologist.")

As it is evident from the foregoing quotations from Doctor Rosenow's article that he now believes that his "coccus" can develop a bacillus form, and as this change was one of the main points brought out by me I trust I will be excused my desire to claim credit accordingly.

To more fully explain my position I quote some conclusions, given in my article, last referred to.

"It is demonstrated that the organism isolated from the nerve centers of cases of poliomyelitis (including the "streptococcus" described by various observers) is a pleomorphic bacillus of the distemper group, which varies in characteristics much as the various, supposedly different, members of the group do from one another; that this poliomyelitis bacillus could cause paralysis in cats, dogs, rabbits, and guinea pigs, and that an accidental passage of a culture through man gave rise to abortive symptoms of the malady; that after this last named passage it could produce paralysis in a rabbit, and a contagious infection of guinea pigs, with nerve center lesions; and, finally, that from the guinea pigs it could produce distemper in cats."

I will add, further, that in an epizoötic of paralysis among dogs, which occurred last spring in Queen's Borough, New York City (reported by Dr. W. L. Johnson and myself in the *Medical Record* of November 17, last), a similar bacillus was found to be the causative organism.

Respectfully,

Horace Greeley.

140 Clinton Street, Brooklyn, N. Y.

January 15, 1918.

Public Health Notes.

Abstracted by Dr. M. E. Champion, M. P. Horowitz, and R. R. Harkness.

Public Health Ministry for Austria.—"An Imperial Decree was issued on June 1, 1917, constituting a Ministry of Public Health and Social Welfare for Austria. It is to supervise the care of war invalids, to combat war diseases, and to centralize preëxisting, uncoördinated departments of public health and sociology. It is to have the care also of the dependents of fallen soldiers, infant welfare, housing and insurance. Though the medical profession is to be liberally represented, the first Minister, Doctor Baernreither, is not a medical man. One of the most important problems to be solved by the new ministry is the future of the numerous war hospitals, which have cost much labor and money."—*British Medical Journal, Dec. 15, 1917.*

(*Peter H. Bryce.*)

✠

Fifth Annual Report of the United States Children's Bureau.—Miss Julia C. Lathrop, Chief of the Children's Bureau of the United States Department of Labor, analyzes the work done in the annual report for 1917. The report discusses the Child Labor Act and its enforcement; infant welfare, with special reference to the care of maternity and infancy; child welfare work in the warring countries; recommendations for child welfare work in war time; soldiers compensation and insurance; problems of dependency and delinquency as affected by the war; and lastly, a plan for public protection of maternity and infancy with federal aid.

During the year, 300,000 children under 5 years of age died. The infant mortality rate for the birth registration area in 1915 was 100, and the most favorable rate for a state was 70. This was for Minnesota. During 1916, New Zealand reported an infant mortality rate of 50. The point is made, that much can be done in this country to reduce the present infant mortality rate.

Since the Bureau was founded, field studies have been made in Johnstown, Pa., Montclair, N. J., Manchester, N. H., Brockton, Mass., Saginaw, Mich., New Bedford, Mass., Waterbury, Conn., Akron, Ohio, and Baltimore, Md. A very interesting correlation between infant mortality and the father's earnings was brought out. It was shown that the infant mortality rate varies inversely as the amount of the father's earnings. It was also shown for Manchester, N. H., that where the father's earnings were small, the mother would frequently be gainfully employed following the baby's birth.

The report recommends the following war time program.

1. Public protection of maternity and infancy.
2. Mothers' care for older children.
3. Enforcement of child labor laws and full schooling for all children of school age.
4. Abundant and decent recreation for children and youth. (*M. P. H.*)

✠

Smallpox Vaccination.—The United States Public Health Service in the Public Health Reports for November, 1917, has the following recommendations regarding smallpox vaccination:

Fresh vaccine should always be employed, and should be carefully iced pending use. The operation of vaccination should be performed not by cross scratching, but by one of three methods: (1) linear incision about one-fourth inch long using a needle or similar instrument; (2) drill method with a Von Pirquet scarifier; (3) multiple punctures with a sterile needle through a drop of virus and just through the epidermis. The punctures should be confined to an area not more than one-eighth inch in diameter. The first two methods necessitate allowing the vaccine to dry on the arm. After care of the vaccination wound calls chiefly for cleanliness; shields and similar devices should be avoided. The crust which forms should be preserved intact.

Vaccination is indicated by the time the child is six months old; it should be repeated at about 6 years of age and whenever smallpox is epidemic.

(*M. E. C.*)

✠

A School Inspection Manual.—*Health Notes*, the monthly bulletin of the Florida State Board of Health, for January, 1918, is devoted to

medical inspection of school children and to school sanitation.

A well-written editorial emphasizes the necessity and importance of medical inspection of school children, and the problems of school sanitation are discussed in an article by George W. Simmons, Jr., Chief, Bureau of Engineering, State Board of Health. Specimens of the forms in use for the examination of school children are shown, and complete instructions to district health officers, nurses, and teachers for making the inspections are included. Excellent bibliographies of the literature on these subjects appear in the bulletin.

Health officers and others interested in this important phase of health work will be repaid in examining this number of the Florida *Health Notes*. (*R. R. H.*)

*

Cups and Glasses must be Washed in Boiling Water.—According to the *Municipal Journal* for December 22, 1917, the California State Board of Health has recently promulgated a new regulation, which requires that all drinking cups and glasses used in restaurants, at soda fountains and other places must be washed for five minutes in boiling water containing 5 per cent of lye. (*M. P. H.*)

*

Infant Care in Rural Districts.—A recent report of the Children's Bureau of the United States Department of Labor deals with the available facilities for the care of mothers and babies in rural districts. This particular report is based on studies made in a single county in Kansas. Most of the families studied were those of farmers or farm workers, and were fairly well-to-do. Telephones and good roads were the rule. No family was further away from a doctor than 20 miles.

The results brought out were these: Two-thirds of the mothers had no prenatal care at all and more than one-third had no postnatal medical care. Moreover among those credited with having such care, few instances were found where the care was adequate. Four-fifths of the farmers' wives had to do heavy housework until near the time of confinement. The infant mortality was found to be 40 per thousand births—a low figure for city conditions, comparatively high for a prosperous rural county.

ork now being done in poorer districts by the same bureau points toward results correspondingly more unfavorable.

The Children's Bureau is urging more adequate medical and nursing care through hospitals, conference centers, and more doctors and nurses. The suggestion is made that the establishment of a rural nursing service may be the next step for such counties as the one studied. (*M. E. C.*)

*

Purification of Distilled Water.—It is quite possible that distilled water can be contaminated during the process of ice making if due precautions are not taken, says Harry B. Hommon, in *Ice and Refrigeration, for November, 1917.* This experience was made near a cantonment in a city which was under the supervision of the United States Public Health Service. This particular plant furnished more than fifty per cent of the ice used in the city. A typhoid fever outbreak focused suspicion upon the ice plant. To all appearances the distilled water ice plant operated faultlessly; however, a more thorough investigation brought out the facts that the sterilization of the filters did not properly function, and that as a consequence the water subsequently remained contaminated. A remodeling of the plant gave the desired result. The typhoid outbreak in the city was not laid to the impure ice produced but the investigation showed that the plant was at least a potential source of disease. (*Arthur Lederer.*)

*

Danger from Wood Alcohol Bath.—Dr. John M. Robinson of Duluth, Minnesota, writing in the *Journal of the American Medical Association* calls attention to the dangers of methyl alcohol. He quotes the record of a patient who had marked impairment of vision as the result of daily baths for two weeks with wood alcohol. Another man had sudden blindness come on after having rubbed his legs with wood spirit each day for a month. The author reports a case of his own who showed symptoms of wood alcohol poisoning apparently as the result of having worked at dyeing hats with a commercial product containing 4 per cent wood alcohol. (*M. E. C.*)

*

County Control of Measles.—According to the *Medical Officer* for November 24, 1917, Dr. W. G. Savage recommends the employment by counties, of nurses, whose duty it shall be to

visit the homes affected with measles, in order to give home treatment and advice. The work may be enlarged to include whooping-cough and general hygiene. At the present time very little is done in this way within the county. The article refers particularly to the County of Somerset, England. (*M. P. H.*)

✽

Ohio Plans to Save Mothers.—The Ohio State Department of Health, through its Division of Child Hygiene, is about to launch a new enterprise—a bureau of registration for mothers. Thus writes Dr. Frances M. Hollingshead, director in charge of the work, in the December *Ohio Public Health Journal*.

The United States stands thirteenth in a group of fifteen countries with regard to loss of life from childbirth. There are two outstanding causes for existing conditions: first, the lack of available facilities for many women; second, the almost dense ignorance among part of the women in all walks in life.

Doctor Hollingshead states that "the first step in the prenatal campaign will be that of establishing in the State Department of Health a confidential registration of mothers—a bureau where pregnant women may register and from which information may be sent out. As long as possible, the answers to questions and information given out will be of a purely personal nature."

An attempt will be made to give sane and safe information to women in industry and to those women who have the family duties to perform, regarding work before and after confinement.

It is believed that this work will relieve the busy practitioner and yet will not disturb the relationship between family and physician.

(*R. R. H.*)

✽

A Public Health Car in Kansas.—By converting an unused Pullman Coach into a travelling exhibit, the Kansas State Board of Health has been giving the people of the state an opportunity to see, as well as hear, truths regarding health, and reasons for obtaining more public health nurses.

All of the departments of the State Board of Health and the Kansas Association for the Study and Prevention of Tuberculosis are represented in the exhibits.

The car is in charge of two public health nurses who describe the exhibits and give short talks on the value of public health nursing.

This interesting method of health education is described by Margaret McKnight in the November *Bulletin* of the Kansas State Board of Health (*R. R. H.*)

✽

Public Health Nurses and Army Camps.—Fifty Public Health nurses have been assigned for duty by the American Red Cross to the zones around the National Army cantonments, National Guard camps, and naval bases. The nurses will work under the Red Cross sanitary directors in coöperation with the local, state and federal health authorities. Nurses have already taken up their work in civil districts around cantonments at Hattiesburg, Miss.; Fort Riley, Kans.; Des Moines, Iowa; Louisville, Ky.; Little Rock, Ark.; Ayer, Mass.; Chillicothe, Ohio; Atlanta, Ga.; Newport News and Petersburg, Va. As visiting nurses in the rural territory and cities adjoining the camps, the Red Cross nurses assigned to public health work will endeavor to prevent the spread of tuberculosis, malaria, and social diseases, and to strengthen the local infant welfare programs.

Sanitary units of the Red Cross are to be placed at the disposal of the Public Health Service and state and county health authorities. Specifically, they will aid constituted officials in insuring the purity of milk and water supplies, and in cleaning up unsanitary places near the camps which might be dangerous as germ incubators. The inspectors will patrol the territory surrounding camp limits to enforce sanitary regulation in coöperation with the sanitary officers of the Army.—*Public Health Nursing, November, 1917.*

(*R. R. H.*)

✽

Smallpox in Pennsylvania.—The *Municipal Journal* for December 6, 1917, quotes Dr. Samuel G. Dixon to the effect that smallpox is prevalent in 12 counties, and that 38 patients are under quarantine. Ohio also has many cases, and Cumberland, Md., just across the border, has 10 cases. The coöperation of the public and the physicians is requested in locating every possible case. (*M. P. H.*)

Overcrowding in East Chicago.—From clippings furnished through the courtesy of Mr. H. G. Osborn, City Health Inspector, we learn that due to the influx of thousands of workers needed to make munitions and other war materials, East Chicago, Indiana, is confronted with a serious problem of overcrowding, and a shortage of houses. The Indiana State Board of Health has ordered the local health authorities to enforce the housing law and general sanitary ordinances of the city. To enforce the housing law will mean the ejection of 500–600 people out of a population of 30,000 from their present homes, and probably will force them out of the city. An attempt will be made to have the industrial concerns furnish funds with which to supply more houses to relieve the present congestion. This is necessary if the workers are to be retained and the efficiency of the industrial plants maintained. (*M. P. H.*)

✱

What Can Be Done with Garbage.—New York City's garbage, by treatment in a $3,000,000 recovery plant of the latest type on Staten Island, yields the following commercial products:

Grease for 70,000,000 cakes of soap; 1,500 tons of nitrogen; 2,000 tons of phosphoric acid; 500 tons of potash. With the nitrogen, and the glycerin from soap making, there is a recovery of material yielding 3,500,000 pounds of high explosives, while the phosphoric acid and potash, as well as the nitrogen, are valuable in the making of commercial fertilizers.

This plant operating under the so-called Cobwell process, which treats garbage almost entirely by chemical methods, has effected increased recoveries of valuable products amounting to at least 25 per cent. more than recoveries under the best previous reduction methods used for New York's garbage. In soap, for instance, there is an additional recovery of grease for 10,000,000 cakes a year, and in high explosives material for 700,000 pounds.

Under a contract with the city the Metropolitan By-Products Co. (Inc.), takes all the garbage from the Boroughs of Manhattan, The Bronx, and Brooklyn for a period of five years, beginning with 1917, paying $900,000 for the raw garbage during that period. Garbage is deposited on scows along the Hudson and East Rivers and hauled to the plant during the night. The chemical treatment followed not only eliminates all odors incident to the old boiling process, by which garbage was cooked for a long period in water, but saves many of the rich chemical elements which were formerly lost. Under the old process it is said a large percentage of these elements were cooked into a rich soup, and then the soup was thrown away. Moreover, a considerable percentage of grease was burned by the high temperature driers used before degreasing, and the cooking process had a splitting effect upon the material which led to considerable losses of glycerin, which ran away in waste water. The new process saves these materials. The plant required is more expensive to install, but much more economical in operation.—*Weekly Bulletin, United States Food Administration.*

✱

Typhoid Fever.—P. S. Schenck, Norfolk, Va. (*Journal American Medical Association*, October 27, 1917), gives an account of a small epidemic of nineteen cases of typhoid fever caused by the patients eating turkey salad at a reception given by a local club. The salad was made by a colored caterer of local reputation. Six of the reception guests who partook of the salad came down with typhoid fever within fourteen or sixteen days afterward. After the reception a bowl of salad was sent to an orphan asylum in which there were eight little girls, six of whom took the disease. One of the colored women who assisted in preparing the food ate some of it and gave some portions of it to her two children and to her brother who visited her. Another colored woman, who also assisted, carried some home and gave it to her two children and also her two nephews, all four of whom came down with typhoid. All these patients had the usual period of incubation, except one of the colored women, who developed typhoid fever within three days after the reception. She, however, had been taken sick two weeks before the reception although she had not taken to her bed in the interim previous to developing typical typhoid. Other causes, such as water, milk supply could be excluded in all the cases.

✱

"'Tis a wise community which places community health above all other community possessions."—*North Carolina Health Bulletin.*

Industrial Hygiene and Sanitation.

Abstracts prepared by Drs. F. R. Hayhurst, R. P. Albaugh and P. M. Holmes.

Sanitary and Engineering Industrial Standards. *Bureau of Hyyiene and Sanitation (John Roach, Chief), Department of Labor, New Jersey,* Trenton, N. J. 36 pp. This pamphlet, which is well indexed, gives the minimum sanitary regulations for washing facilities, dressing rooms, toilet facilities and drinking water, then follows a description of the methods for computing the size of exhaust systems and for the construction and installation of them for dust, fumes, heat and humidity. The application of such systems to fifteen different industries is separately delineated. The department furnishes blue prints for various installations.

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Safety Standards for Lead Corroders and Lead Oxidizers, Paint Grinders, Dry Color Manufacture. *Bureau of Hygiene and Sanitation (John Roach, Chief), Department of Labor, New Jersey,* Trenton, N. J. 28 pp. Three sections of the enabling act, which provided for the prevention of lead poisoning and other occupational diseases in the State of New Jersey, introduces this excellent set of regulations or standards which amplify these sections. The provisions of the Standard Lead Bill, fathered by the American Association for Labor Legislation, are greatly extended both by law and by these regulations of the Department of Labor in New Jersey. Hence the users or handlers of these substances are covered by law as well as the pure-process manufacturers, which is all that is specified in the Standard Lead Bill. Instructions to employes and the blank form used in reporting are given for all of the hazards in industries mentioned in the title.

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Safety Standards for the Manufacture of Nitro and Amido Compounds. *Bureau of Hygiene and Sanitation (John Roach, Chief), Department of Labor, New Jersey,* Trenton, N. J. 18 pp. New Jersey and Pennsylvania are chief centers for the manufacture of high explosives and the loading of the same into projectiles. In both states regulations have been drawn up for the prevention of occupational diseases in the handling of the poisonous substances used, principal among which are the nitro and amido compounds of the aromatic series. Precautions in building construction and for the various processes of manufacture are given as well as specific health precautions, minimums for physical examination, and reporting forms, while special emphasis is laid upon trinitrotoluol, acid fumes and the handling of chemicals.

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Industrial Fatigue in Its Relation to Maximum Output. H. J. Spooner, Copartnership Pubs., London, 1917.

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Death of Professor Rambousek. The death is announced at the age of 43, of Dr. J. Rambousek, professor of factory hygiene, and chief state health officer, Prague. *Science,* December 28, 1917.—Rambousek's book "Industrial Poisoning," translated by Thos. M. Legge 1913 (Edw. Arnold, London), is still the standard work upon this subject.

*

Ventilation Laws in the United States. Also Board of Health Requirements and Regulations of National Board of Fire Underwriters. Together with Model Ventilation Requirements as Promulgated by the American Society of Heating and Ventilating Engineers. Third revised edition, *Heating and Ventilating Magazine Company,* 1917, 1123 Broadway. Price, $1.00. 178 pp., cloth.

*

The Edison Lamp Works of the General Electric Company, Harrison, New Jersey, has issued a number of booklets and bulletins upon illumination, among which are to be specially mentioned (1) The Lighting Handbook, 94 pp.; (2) Handbook on Incandescent Lamp Illumination, 1916, Vest Pocket Edition, 212 pp.; (3) Engineering Data on Incandescent Lamps, August 1, 1917, 25 pp. and (4) Bulletins—these are issued upon the lighting of various forms of interiors as well as flood lighting.

*

Is Death from High Temperature Due to Accumulation of Acid in Tissues? A. G. Mayer. *American Journal of Physiology,* Baltimore, November, 1917, XLIV, No. 4, p. 581. Apparently, death from high temperature is due to

the accumulation of acid in the tissues, possibly carbonic acid. It is not due to asphyxiation.

✱

Brachial Neuritis and Sciatica. H. T. Patrick, *Journal, Amer. Med. Assn.*, December 29, 1917, p. 2176–2179, illus. The great prevalence of aches and pains in the arms and legs of industrial workers makes this article by Patrick, which is chiefly one of differential diagnosis, one of especial interest. Several new diagnostic points are described.

✱

Ventilation Standards and the Synthetic Air Chart. E. V. Hill. *Journal of the American Society of Heating and Ventilating Engineers*, July, 1917, pp. 477–498. In this valuable contribution Doctor Hill discusses the development of graphic representations of air condition findings and the results of his numerous experiments. In the end, he has devised a so-called synthetic air chart by the use of which the "per cent of perfect" may be indicated for all of the usual hazards encountered in determining the condition of ventilation in given quarters. The method appears to be a most convenient one for recording test data.

✱

Notes on the Testing of Heating and Ventilating Equipment. D. D. Kimball, J. I. Lyle and Arthur K. Ohmes. *Journal of the American Society of Heating and Ventilating Engineers*, July, 1917, pp, 595–624. This article is of the utmost value to industrial hygienists in that it describes testing methods and apparatus which should be considered standard in determining ventilating conditions and also briefly summarizes the methods or mechanics of securing proper heating (or cooling) and ventilation.

✱

Congress of Human Engineering. *Ohio State University Bulletin*, Vol. XXI, No. 12, 1917, 160 pp. This congress, which was held at Ohio State University, brought together a number of persons prominent in the vanguard of industrial betterment in the United States, representing manufacturers, workers and social economists. The various papers have to do principally with the ideals to be attained.

✱

British Reports on Hours of Work, Output and Fatigue. *National Industrial Conference Board*, 15 Beacon St., Boston, November, 1917, 57 pp. This is a critical analysis of the preliminary reports of the Health of Munitions Workers Committee of Great Britain. The National Industrial Conference Board is now investigating the same subjects of itself, but finds it timely to discuss these British reports more as a matter of information than to set forth conclusions. The board takes definite exceptions to some of Dr. H. M. Vernon's specific conclusions principally because of the limited scope of the data and says that the report of Professor Kent should be disregarded because inferences or conclusions were drawn from too small groups of workers and too brief periods of time. As the report represents the best criticism which has so far appeared concerning these British investigations, it should be read in full.

✱

Garage Workers and Motorists. *Natl. Safety Coun., Chicago, Bull. Bd. Ser. No. 485.* This one-page poster, adapted from a leaflet of the Ohio State Department of Health, gives timely publicity to the dangers of motor gas poisoning, or gasoline engine exhaust fumes, and the methods of eliminating the danger.

✱

Decisions of Courts Affecting Labor; 1916. *U. S. B. L. S. No. 224.* Among many decisions on hours of labor and factory regulations etc., are to be noted the synopses of a case decided in Connecticut and one in Ohio courts upon occupational diseases in which compensation was not allowed because of the word construction of workmen's compensation acts in those states.

✱

Anthrax in California. *J. A. M. A.*, November 17, 1917, p. 1717. Eight human cases reported and the State Board of Health has issued warnings in regard to the handling of sick stock and the skinning of dead animals.

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Occupational Diseases in Massachusetts General Hospital. David L. Edsall, *U. S. B. L. S.*, December, 1917, pp. 169–185. An extension of the method of inquiry in the Massachusetts General Hospital into the extent of diseases purely or partly occupational was given one year's trial, before the war caused a discontinuation. During this time from 20 to 30 or more patients per day were sent to the industrial clinic (a rate of more than 5,000 cases a year) from the hundreds admitted each day. To get a

line on the possible industrial affliction of applicants, a social worker, trained to some extent in industrial health hazards, interviewed each one immediately after his or her admission to the institution. The social worker had before her two lists, the first indicating the kind of patients that must always be referred to this clinic, and the second, a list from which some are sent according to whether inquiry brought out certain conditions. Reproductions of the blank forms used, an interesting list of exposures found, a large table of industries and trade processes in which lead poisoning occurred, and copies of educational leaflets, are all given in the article. The author takes exception to a remark of Prof. Willard Fisher that industrial diseases are not very common and produces records to show that they are not, in the least, uncommon. He advocates trained medical men, as they have in England, to give decided opinions in these matters and maintains that training in industrial diseases is as necessary as training in surgery. As an ultimate solution of the compensation aspect of these cases he is of the opinion that something which spreads out all over the industry and is aided by the state, such as health insurance, is needed.

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An Industrial Clinic. Wade Wright, *U. S. B. of L. S.*, December, 1917, pp. 185–193. Dr. Wade Wright, head of the industrial clinic of the Massachusetts General Hospital, till the war forced its discontinuance through lack of staff, discusses 5,121 cases received into that clinic during the year March, 1916, to March, 1917. The principal innovation was the selection of patients upon the basis of industry or trade process without relation to the particular ailment or complaint presented. With the aid of social and factory inquiry an immense amount of corroborative industrial influences were found in their afflictions. Several tables show the principal disease conditions found among various groups of workers and the table showing the distribution of lead poisoning by trade processes and industries of 148 positive cases is truly surprising. Doctor Wright then discusses the symptoms of lead poisoning in particular, chief among which are low abdominal pain associated with constipation, weakness of one or both wrists, pain in the lower lumbar and sacro-illiac regions, a lead line observed in 78 cases, especially by everting a tab of gum-margin, pain in the external condyle of the humerus, the blood findings, and the result of 238 analyses for lead in urine and stools, of which 97 were positive. There was but one instance where lead was found in urine but not in stools, but the opposite condition was frequently found. (The reviewer would point out that lead in either urine or stools does not in itself mean lead poisoning—*i. e.*, toxic symptoms must also be present—since the patient may be eliminating enough of the lead to prevent its concentration in the body in toxic amounts. E. R. H.) The industrial clinic undertook the treatment only of lead poisoned persons, an important part of which was personal instructions in avoiding future poisoning.

Public Health Laboratory Notes.

Abstracts by Dr. Arthur Lederer.

APPARATUS AND TECHNIQUE.

On the Development of a Method for Early Diagnosis of Tuberculosis by the Use of the Ex-Rayed Guinea Pig.—Experiments indicate that it is possible, by means of the x-Ray to increase the susceptibility of guinea pigs to tuberculosis. Frequently repeated doses have a more certain effect than a single dose. The removal of an nodule from the groin for examination can be done in about two weeks and is usually diagnostic.—W. H. Eckford, *Jour. Lab. and Clin. Med., 3, 175.*

An Improved Modification of the Durham Fermentation Tube.—The small inner tube is inverted over a wooden rod so that it is lifted some distance from the bottom of the test tube, allowing free circulation of the medium in and out of the inverted tube. This arrangement has the advantage that shaking is more thoroughly accomplished since the impact of the inverted tube with the wooden rod causes a sort of churning movement which draws in and expels the medium. Raising the mouth of the inverted

tube causes a certain amount of gas which is formed between the mouth of the inverted tube and the bottom of the large tube to be caught. This modified procedure of employing Durham fermentation tube is being carried on successfully in the Richmond Health Department.—K. D. Graves, *Jour. Am. Med. Assn., 69, 2102 (1917).*

✱

Aids to Laboratory Efficiency.—Description of a number of methods and pieces of apparatus which facilitate chemical laboratory work. The author discusses his method of routine staining, the installation of siphon delivery bottles for common reagents, and arrangement for keeping glass rods and pipettes instantly available, a home-made hanging-drop slide procedure etc. —Miles J. Breuer, *Jour. Lab. and Clin. Med., 3, 241 (1918).*

✱

The Bruck Precipitation Test for Syphilis.—Bruck, the corroborator of Wassermann on the complement fixation test has recently brought out a precipitation test for which he claims specificity. The test was reported in the last issue of the American Journal Public Health. A. W. Stillians performed a new test under the conditions prescribed by Bruck in 209 cases. He found that the test failed in a considerable percentage of early secondary syphilis. A positive reaction was obtained in from 24 to 28 per cent of nonsyphilitics. *Jour. Am. Med. Assn., Dec. 15, 1917, p. 2016.*

A Useful, Flameless, Transportable Incubator for use in the Field.—The apparatus consists essentially of a double-walled, metal chamber covered on the outside with good insulating material, as paper and felt. The space between the walls is filled with water at 50 C. After one hour the temperature in the chamber is 41 C., and after twelve hours it is 32 C. By changing the water twice in twenty-four hours, the apparatus can be used as an incubator, but its chief use is to transport sensitive research material in the field.—Erich Hesse, *Deutsch. Med. Wchnschr, 42, 979; Chem. Zentralbl, II, 627 (1916); Chem. Abstr. 12, 45 (1918).*

✱

The Mechanism and Significance of the Gum Mastic Test.—In 1915, Emanuel (*Berl. klin. Wchnschr.* 1915, 52, 781; *Jour. Am. Med. Assn.*, Sept. 4, 1915, p. 908) announced a new colloidal reaction in syphilis. He used gum mastic, a reagent which was very easily prepared. Of thirty tests made on psychiatric patients, there occurred complete precipitation in all the tubes in fourteen syphilitic cases. S. L. Immerman found on using Cutting's modified technique that the amount of precipitation in the gum mastic reaction depends on the quantity of globulin present in the spinal fluid tested. The maximum precipitation is obtained with an optimum amount of globulin. Immerman also concludes that the reaction does not determine whether the fluid is syphilitic or nonsyphilitic. The test is not equivalent to or supplementary to the colloidal gold reaction.—*Jour. Am. Med. Assn., Dec. 15, 1917, p. 2030.*

BACTERIOLOGY AND PATHOLOGY.

Wassermann and Luetin Reactions in Tuberculosis.—Seventy-nine of a total of 170 negative Wassermann cases gave a positive luetin reaction, while only 18 out of a total of 28 positive Wassermann cases gave a positive reaction, justifying the conclusion that a luetin reaction cannot be used as a test for syphilis in a tuberculosis sanatorium to displace the Wassermann test.—H. J. Corper, W. A. Gekler, H. C. Sweany, *Am. Review of Tuberculosis, 1, 544 (1917); Jour. Am. Med. Assn., 69, 2147 (1917).*

✱

The Schick Test with Especial Reference to the Negro.—The purpose of this study was to determine what color changes occur on very dark or black skins and the degree of natural immunity to diphtheria that negroes possess. In practically all cases tested in negroes there was produced a pigmentation darker in color than the skin. The reaction was equally as clear-cut as it is in whites. A study of 210 cases indicates that adult negroes possess about the same degree of immunity to diphtheria as do white adults.—Louis T. Wright, *Jour. Infect. Dis. 21, 265 (1917); Chem. Abstr. 12, 59 (1918).*

✱

Rapid Method for Identification and Isolation of Meningococci from the Nasopharynx.—The method proposed employs a fluid medium which serves to eliminate other organisms resembling

the meningococcus in about twelve hours and to reduce the full time required to identify the latter by at least one day. The medium consists of a 1 per cent glucose broth to which is added 5 per cent of unheated, sterile, clear, normal horse serum. One cc. of this medium is placed into tubes. Suspicious colonies on plate cultures are fished and seeded, a colony to each tube. These tubes are incubated for 12 hours. The meningococci grow in a characteristic manner. The fluid becomes faintly turbid, and a slight sediment forms. The sediment emulsifies uniformly when the tube is shaken. This observation eliminates at once a set of tubes. To the suspicious tubes is added 0.1 cc. of a 1 to 10 dilution of 0.85 per cent saline solution of a high-titre polyvalent anti-meningococcic serum. The tubes containing meningococci exhibit distinct agglutination. Those containing other organisms remain unchanged. The readings are checked by means of films stained by Gram's method.—Peter K. Olitsky, *Jour. Am. Med. Assn. 70, 198 (1918).*

✻

Rapid Cultivation of Diphtheria Bacilli.—The method is based on the fact that the true diphtheria bacilli seem to be the only ones in their class that attack glucose and turn litmus red. Control tests in nearly a hundred cases have confirmed the prompt and reliable findings with this technique. The results were particularly satisfactory in the carriers whose scanty bacilli it was difficult to detect with other techniques. The culture medium is a mixture of 100 cc. horse serum, 10 cc. of a 30 per cent sterilized solution of glucose, 30 drops of concentrated and sterilized tincture of litmus and 3 cc. of 1 per cent solution of sulfuric acid. This mixture is distributed in Petri dishes. It is coagulated in the autoclave or with dry heat, very slowly raising the temperature to 75° or 80° C. and keeping this up for an hour and a quarter. The medium is blue with a slight greenish tinge, transparent, firm and elastic. It is inoculated with a triangular loop of platinum passed over the end of the cotton with which the throat has been swabbed. The loop is then dragged along the surface of the medium in parallel segments until all is smeared. The plates are then incubated at 37°C. In 24 hours the true diphtheria bacilli colonies show as transparent red pin heads. The false diphtheria bacilli do not attack glucose or modify the litmus tint. Staphylococci sometimes turn the medium red, but the aspect of the colonies is different and the microscope will settle their identity.—S. Costa, J. Troisier and J. Dauvergne, *Bull. de la Soc. Med. des Hôpitaux 41, 991 (1917); Jour. Am. Med. Assn. 70, 198 (1918).*

✻

Determination of Types of Pneumococcus in Lobar Pneumonia.—A selected kernel of sputum about the size of a bean is washed, emulsified in broth, and inoculated directly into a centrifuge tube containing about 4 cc. of a special medium—glucose blood broth. After incubation in the water bath at 37 C. for five hours a blood agar plate is streaked with a loop full of culture fluid for the isolation of the pneumococcus in pure culture and the subsequent confirmation of type. The red blood cells are then removed from the culture medium by slow centrifugation. Three cc. of the supernatant bacterial suspension are pipetted into a second centrifuge tube containing about 1 cc. of sterile ox-bile and allowed to stand in the water bath at 37 C. until solution of the pneumococcus bodies has occurred, usually about twenty minutes. Five-tenths cc. portions of the bile solution of pneumococcus are used in precipitin reaction by mixing with an equal volume of immune serums. If bile is not available determination of the type of pneumococcus may be made directly on the bacterial suspension by macroscopic agglutination. The author recommends this method when an emergency is to be met. When mice are available he favors the use of the original method of inoculation.—O. T. Avery, *Jour. Am. Med. Assn., 70, 17 (1918).*

✻

Isolation of Tubercle Bacilli from Milk.—The author isolated tubercle bacilli by Petroff's method from 64.8 per cent of the sputums which were found to be positive by direct microscopic method. The organism was recovered from 69.2 per cent of the samples of milk that were artificially infected. Of the milk obtained through the New Haven Health Department Laboratory 8.4 were found to contain tubercle bacilli. Stewart concludes that Petroff's method for the isolation of tubercle bacilli from sputum may be applied successfully to the examination of milk. With slight modifications the method should prove constant and reliable. The need

of such a method for the examination of milk and milk products is apparent.—F. C. Stewart, *Jour. Exper. Med. Balti., 26, 755 (1917); Jour. Am. Med. Assn., 69, 2149 (1917).*

✽

The Treasury Department Standard for Drinking Water; Its Value and Enforcement.—H. P. Letton concludes that the requirement of the standard regarding total count is very lenient (100 colonies per 1 cc. on agar at 37 C. after 24 hour incubation). It could be reduced more than half without eliminating any but an extremely small percentage of supplies that would otherwise pass the requirements. The limit of permissible B. coli content according to Letton is not too low (2 B. coli per 100 cc.), Sanitary surveys of the sources of supply are absolutely essential to correlate the bacteriological analyses. A very animated and illuminating discussion of the subject by leading sanitary engineers follows the original article.—*Jour. Am. Water Wks. Assoc., 4, 478 (1917).*

✽

The Toxin of Bacillus Welchii.—The toxicogenic power of 10 strains of B. welchii has been tested with the result that all the strains have been found to produce toxin in greater or less degree. An antitoxin produced by the injection of toxin from a single strain is capable of neutralizing all of the toxins. This fact furnishes strong evidence of the common nature of the toxic products of the various strains.—Paul H. DeKruif, Th. W. Adams, Paul M. Island, *Jour. Infect. Dis., 21, 580 (1917).*

✽

Cultivation of Tubercle Bacilli from Blood.—M. C. Clough states that the occurrence of tubercle bacilli in the circulating blood at least in sufficient number to infect a guinea pig, is relatively infrequent (6.7 per cent) in all forms of tuberculosis other than miliary tuberculosis, whereas in miliary tuberculosis, tubercle bacilli occur in the blood in a large percentage (66.6 per cent) of cases. Tubercle bacilli have been grown in culture by Clough for the first time from the circulating blood of five patients with miliary tuberculosis. Blood cultures are suggested as an aid in the differential diagnosis of acute miliary tuberculosis from other nontuberculous infections, and as a means of studying bacillemia in all forms of tuberculous diseases. Direct cultures from spinal, pleural, peritoneal and other fluids are recommended in those cases in which tubercle bacilli cannot be demonstrated by smears.—*Am. Review of Tuberculosis (Balt.), 1, 598 (1917); Jour. Am. Med. Assn., 70, 125 (1918).*

✽

Determination of Pneumococcus Types.—This test yields valuable and quick results. By its use the injection of a mouse or the use of a culture is unnecessary and Type 1 infections may usually be ascertained within an hour or two after the sputum is collected. The sputum is collected in a sterile container, 5 cc. of the sputum are pipetted into a small mortar. Relatively fine sand is added in sufficient quantities to make a rather stiff mixture. To the ground mixture 10 cc. of saline solution are added. The sand is allowed to settle and the supernatant liquid is pipetted off into a clean centrifuge tube. Ten cc. of saline solution are now added to the sand in the mortar. After mixing well, as before, the fluid is pipetted off into a second centrifuge tube. In this manner two solutions of the sputum are provided. The first more concentrated solution may be used for the immediate test, and the second less concentrated solution may be held for use in case of accident to the first solution. Both solutions are centrifugalized at high speed long enough to completely clear the fluid. The sputum in solution is brought in contact with the three types of antipneumococci serums 1 cc. of the former to 0.2 cc. of the latter. Often the first evidence of a positive reaction is seen a few minutes after the mixing of the serum and the sputum solution. The mixture is slightly opalescent fluid with a faint smoky "whirl" on shaking. The disappearance of the "whirl" seems to be the first phenomenon of specific reaction. Then, on warming in the water bath for a few minutes, a very slight feathery precipitate may be seen with the naked eye on close examination. As the tubes are left at rest in the water bath, the feathery flakes drift to the bottom of the tube and collect in a typical white mass. In a negative test there is no reaction of any kind and very little sedimentation.—O. W. H. Mitchell and W. E. Muns, *Jour. Med. Research (Boston) 37, 339 (1917); Jour. Am. Med. Assn., 70, 128 (1917).*

CHEMISTRY.

Estimation of Organic Carbon in Water.—An account of a modification of the Carrasco-Plancher method for estimating organic carbon in sewage and natural waters. It is recommended as both accurate and rapid.—Atilio A. Bado, Anal. Soc. Cuim. Argentina 5, 102 (1917); *Jour. Chem. Soc., 112, 541 (1917).*

Micro-Kjeldahl Methods.—A detailed description of the Kjeldahl methods applied to the estimation of nitrogen in small amounts of materials such as 0.5 cc. of urine or 10 mg. of an amino-acid.—Emil Abderhalden and Andor Fodor, *Ztschr. Physiol. Chem. 100, 190 (1917); Jour. Chem. Soc., 112, 540 (1917).*

Public Health Clippings.

Prepared by R. R. Harkness.

FRENCH ANTI-MOSQUITO CARTOONS.

Professor S. M. Gunn, Associate Director of the Tuberculosis Commission to France, has kindly sent us some French Anti-Mosquito cartoons which are reproduced herewith. We take pleasure in acknowledging the courtesy of Prof. Gunn.—Editor.

POUR REVENIR EN BONNE SANTÉ:

Ce sont certains Moustiques qui inoculent par leur piqûre le microbe du Paludisme.
Au Moustique oppose la barrière de ta moustiquaire.
Au Microbe oppose la quinine.

Translation.

To Return in Good Health:

There are certain mosquitoes which by their sting infect with the microbe of malaria.
Fight the mosquito with your mosquito net.
Fight the microbe with quinine.

◈

Care for your baby,
Whatever you do;
In old age you'll want him
To care for you.

Shakespeare was one of the early advocates of fresh air treatment, for he says in Henry IV: "Give him air and he'll get well."

FRENCH MOSQUITO PICTURE PUZZLES.

Qui cherche, trouve.

—Mon vieux Bernard, pendant que tu es allé chercher du pinard, le sergent t'a flanqué quatre jours!

—A cause? — A cause que t'as pas installé ta moustiquaire et pas pris ta quinine. — Mais le toubib n'a rien vu!

—Erreur, le toubib sait tout et voit tout. Tiens, en ce moment, tu ne le vois pas, et il n'est pourtant pas loin. (*Cherchez-le.*)

"Bernard old man, while you were looking for some *pinard** the sergeant handed you four days!"

"For what reason?" — "Because you did not put up your *moustiquaire*† and did not take your quinine." — "But the *toubib*‡ did not see anything!"

"You are wrong, the *toubib* knows everything and sees everything. Why, at this moment you do not see him, but he is not far off." (*Find him.*)

*Possibly military slang. Our French dictionary does not give this term.

†A protective covering used at night made of mosquito netting.

‡An officer.

—Infirmier!

—Major!

—Vous me donnerez le nom du matricule 2743. C'est un fricoteur! En analysant ses urines, je vois qu'il ne prend pas sa quinine et qu'il ne prend aucune des précautions prescrites contre les moustiques. (*Cherchez le fricoteur.*)

"Orderly!"

"Major!"

"You will give me the name of register number 2,743. He is a rascal! In analyzing his urine I see that he does not take his quinine and does not observe any of the prescribed precautions against mosquitoes." (*Find the rascal.*)

S. S. d'État du Service de Santé M. P. A. O.—No. 13.

The Last Fly.—'Tis the last fly of summer, left buzzing alone; all her many companions have perished or flown. No more do we find them embalmed in our hash; no more are we threatened with typhus or rash.

The bald-head can now risk exposing his pate, assured that no insect will over it skate; Old Dobbin and Bossy, who all summer long beat time to the chorus of threatening song, now stand in the sunshine of gladdening vales, relaxing the muscles of overworked tails.

'Tis the last fly of summer that gladly anoints, with the warmth of our heater, its ossified joints, and shall we not spare her and pity her plight, and give her a bed and supper to-night?

Nay, let us arise, her existence to blot, and bring down the fly-bat with echoing swat, lest she will come back in the beautiful spring and forty-nine million of grandchildren bring. Albert Stroud.—*Bulletin of Kansas State Board of Health.*